

| | |
|---|-------|
| White Pine Blister Rust Control in the Northwestern Region | 1-4 |
| Summary | 1-4 |
| Methods Employed | 1-4 |
| Cooperative Blister Rust Control on State and Private Lands | 5-9 |
| Blister Rust Control on National Forests, Region One | 10-12 |
| Blister Rust Control on National Parks | 13-14 |

WHITE PINE BLISTER RUST CONTROL

IN THE

NORTHWESTERN REGION

January 1 to December 31, 1949

| | |
|--|-------|
| Blister Rust Control, Region One | 15-17 |
| Summary | 15-17 |
| Blister Rust Control | 15-17 |
| Cooperative Blister Rust Control | 15-17 |
| Blister Rust Control on National Forests | 15-17 |
| Blister Rust Control on National Parks | 15-17 |

| | |
|--|-------|
| Blister Rust Control on National Forests | 18-20 |
| Blister Rust Control on National Parks | 21-22 |
| Blister Rust Control on National Forests | 23-24 |
| Blister Rust Control on National Parks | 25-26 |
| Blister Rust Control on National Forests | 27-28 |
| Blister Rust Control on National Parks | 29-30 |

| | |
|---|-------|
| Developmental Work in Methods of White Pine Blister Rust Control | 31-32 |
| Progress of White Pine Blister Rust Control in the Northwestern Region for 1949 | 33-34 |
| Summary of Work for 1949 and Recommendations for Use of Chemicals | 35-36 |
| Improvement of Blister Rust Control and Methods of 1949 Work | 37-38 |
| Blister Rust Control in 1949 | 39-40 |
| Blister Rust Control Survey, 1949 | 41-42 |

United States Department of Agriculture
Agricultural Research Administration
Bureau of Entomology and Plant Quarantine
Division of Plant Disease Control
Blister Rust Control
618 Realty Building
Spokane, Washington

CONTENTS

| | Page |
|---|---------|
| White Pine Blister Rust Control in the Northwestern Region | 1-14 |
| Summary | 1-4 |
| Omnibus Tables | 5-6 |
| Cooperative Blister Rust Control on State and Private Lands | 7-9 |
| Blister Rust Control on National Forests, Region One | 10-12 |
| Blister Rust Control on National Parks | 13-14 |
| Blister Rust Control, Inland Empire | 15-73 |
| Summary | 15-24 |
| Clearwater Operation | 25-34 |
| St. Joe Operation | 35-44 |
| Coeur d'Alene Operation | 45-52 |
| Kaniksu Operation | 53-61 |
| Cabinet Operation | 62-67 |
| Kootenai Operation | 68-73 |
| Blister Rust Control on National Parks | 74-88 |
| Mount Rainier National Park | 74-76 |
| Glacier National Park | 77-82 |
| Yellowstone National Park | 83-85 |
| Rocky Mountain National Park | 86 |
| Spread of the Rust | 87-88 |
| Developmental Work in Methods of Ribes Eradication, and Progress of Ribes Ecology and Disease Control Studies in the Northwestern Region for 1949 | 89-102 |
| Summary of Work for 1949 and Recommendations for Use of Chemicals | 89-92 |
| Improvement of Chemical Methods and Results of 1948 Tests | 92-99 |
| Herbicides Tested in 1949 | 99-100 |
| Stocking-Rust Damage Survey, 1949 | 101-102 |
| Photographic and Educational Work | 103-105 |
| Organization of the Northwestern Regional Office | 106 |
| Appropriations - Northwestern Region | 107-109 |

WHITE PINE BLISTER RUST CONTROL IN THE NORTHWESTERN REGION

Calendar Year 1949

Herman E. Swanson, Regional Leader

Public and private agencies have been fighting blister rust on selected white pine areas in the Northwest for 25 years. In only eight of these years, 1933-1940, under the emergency work relief programs did the control work approach actual requirements. In spite of the handicaps of extreme fluctuations in size of the programs and the inadequacy of the small program of recent years, the control program to date has protected substantial white pine values. Conservative estimates based on field surveys indicate that young white pine stands which will produce at least 5 billion board feet at maturity have been completely protected from blister rust. This stumpage at \$13 per MBF will be worth \$65,000,000. In addition, a potential 7.2 billion board feet of white pine exists in partially protected stands which should have a value of \$94,000,000 at maturity if blister rust control is completed. In accomplishing this, \$17,000,000 (including emergency relief work programs) have been expended for ribes eradication in the control of white pine blister rust in the Northwest.

Blister rust infection occurring before control is established has tended to discredit the effectiveness of the control program. An average of 28 percent of the potential white pine stumpage became infected on the high priority areas before ribes eradication and the loss will be greater on those areas where control work is not yet completed. It is obvious that losses occurring before control is established make the per MBF cost of protecting the healthy residual trees that much greater.

Improved management of white pine lands and new developments in ribes eradication methods are reducing costs of blister rust control. Attention is being given in management to grow all white pine possible in the units protected from blister rust. The Forest Service is definitely committed to this policy. State and private foresters are giving attention to forest practices which will lessen the blister rust control job and produce the maximum of white pine on lands where control work is being performed. Developments in chemicals and methods of applying them in ribes eradication have already reduced costs in the last two years and further important benefits from this field are to be expected. Other new practices in ribes eradication have recently been employed to great advantage and their use is being expanded as experience and application permit. Important in the long term picture is a project for the propagation of white pine resistant to blister rust which was started in the Inland Empire in 1949. Brief statements of this work and other highlights of the 1949 season are presented below.

An adequate and a stable blister rust program is needed for both public and private lands best suited for the growing of white pine and the owner of private timber lands needs assurance of sustained federal assistance if this important natural resource is to be maintained in amounts commensurate to its value to the region and the nation.

Progress in 1949.

The agencies directly engaged in ribes eradication for the control of white pine blister rust in the Northwestern Region were the same as in previous years. The field programs were as follows:

| | Number Camps | Number Workers |
|---|-----------------|-------------------|
| Bureau of Entomology and Plant Quarantine (State of Idaho, Clearwater, Potlatch and Priest Lake Timber Protective Associations as cooperators) | 7 | 243 |
| U. S. Forest Service | 27 | 1,073 |
| National Park Service | <u>3</u> | <u>76</u> |
| Total | 37 | 1,392 |

A total of 53,000 acres was worked in 1949, representing 400 acres more than were worked in 1948. Also, 3,000 less effective man-days were used in 1949. This increased production in 1949 was due to improved work methods and in part to better labor. Men of college age were available in sufficient numbers and they proved to be more stable and qualified than the youthful labor which has comprised the bulk of the force since 1941.

Rework to complete protection on the high priority areas of reproduction and pole size white pine is adding acreages to the maintenance classification each year. Many areas of reproduction apparently in a satisfactory condition are withheld from this classification until subsequent inspections have shown that no new rust infection is appearing on white pine. In 1949, 19,000 acres were placed on maintenance while 6,000 acres of previously protected area reverted to an unworked status as a result of logging operations.

48-Hour Work Week

The 48-hour work week as started in 1948, again was highly advantageous to the project. By reducing the ratio of fixed and other overhead charges to wages paid for ribes eradication and by eliminating much labor turnover, the longer work week lowers effective man-day costs by 16 to 20 percent. Fire duty cut heavily into the working season and without the Saturday work as provided in the 48-hour week, the blister rust control season would have been critically shortened. With a short operating season and labor upon which the project must depend available for less than 3 months, a 48-hour week is a necessity.

Spread of the Rust

Scouting in 1949 for the spread of blister rust in the Northwestern Region found an extension of the known limits of rust on both ribes and white pine. Infected white pine, *Pinus flexilis* or *P. albicaulis*, were found for the first time in Park, Madison, and Lewis and Clark Counties of Montana. The most significant of these is the one in Park County, 2 miles north of Yellowstone

National Park. Infected ribes were found for the first time in Park and Fremont Counties of Wyoming and Lemhi County of Idaho. The infection in Fremont County is an extension of 100 miles east and 50 miles south of previously located infection near Jackson, Wyoming. The new location is 12 miles west of Lander, Wyoming. The ribes infection in Park County is an easterly extension of 38 miles and is 12 miles east of Yellowstone National Park.

Ribes Eradication by Chemical Methods

Chemical methods for ribes eradication were expanded in 1949 and results point toward increased use as techniques and equipment are improved. Lower prices for 2,4,5-T would also help. A summary of chemical work in 1949 is as follows: 2,200 acres treated, 3,900 man-days, and 71,000 gallons of chemical used. Ribes populations on treated areas ranged from 200 to 1,000 per acre. The work was done entirely with 2,4,5-T, except for 23 acres treated with Ammate. Ammate and 2,4,5-T were used to advantage by hand crews to treat decapitated crowns of ribes difficult to pull.

The knapsack and trombone pump, the Hi-Fog gun, and the power sprayer have been the principal equipment used in chemical ribes eradication methods. In 1949, a turbine blower mounted on a turntable and trailer was tried. These trials indicate that the blower may have extensive use in cutover areas, since survey records show that about 90 percent of the ribes on such ground occur within a chain of the roads and cat trails. Ribes and brush were also sprayed with 2,4,5-T from a helicopter. This method may prove feasible, but additional experimentation is necessary before its practicality is determined.

Contracting Ribes Eradication

| <u>Year</u> | <u>By Contract</u> | <u>By Camp Labor</u> | <u>Total</u> | <u>Percentage Contracted</u> | <u>Average Bid Price Per Acre</u> |
|-------------|--------------------|----------------------|--------------|------------------------------|-----------------------------------|
| | <u>Acres</u> | <u>Acres</u> | <u>Acres</u> | <u>Percent</u> | <u>Dollars</u> |
| 1947 | 180 | 81,020 | 81,200 | 0.2 | 7.24 |
| 1948 | 830 | 51,770 | 52,600 | 1.6 | 13.20 |
| 1949 | 3,040 | 49,960 | 53,000 | 5.7 | 13.43 |

In 1949, ribes eradication by contract advanced to a practical basis with 50 contracts awarded and work successfully completed on 3,040 acres. Extensions to June 30, 1950, were granted on other contracts where awards were made late in the season. Two national forests and one cooperative project of the Bureau awarded 42 of the contracts. It will take time for the other six operations to attract sufficient responsible bidders to equal the progress made by the other three operations. The acceptance of contracting by blister rust control supervisors is practically unanimous, and all feel that it has a definite place in the program. Difficulties have been experienced on forests which are starting the work, but once a number of interested contractors accumulate in a territory, these problems seem to disappear. Areas with more difficult working conditions are being put up for contract work than in 1947 which accounts for the higher average bid prices. Ribes eradication by contract is being accomplished

at about a 25 percent lower cost than by labor under force account. As competition among bidders increases, contract prices have come down.

Resistant White Pines

A project was started to establish arboretums of western white pine resistant to blister rust. The arboretums are to be located where the trees will be continually exposed to blister rust infection and away from pollen from nonresistant white pine. The arboretums will provide for the natural elimination of nonresistant trees and eventually become possible seed sources for the production of resistant strains. Fourteen western white pines, very resistant to blister rust since each is growing in a heavy blister rust infection center and has not become infected, have been located, carefully examined, and described. Scionwood from eight of these trees has been grafted on 5-year-old nursery transplants provided by the Forest Service. A total of about 150 grafts have been attempted. Grafts of the veneer, cleft, whip, and bud types are included. Experimental work on rooting western white pine cuttings is proceeding with 6,500 cuttings now undergoing screening trials to determine the best methods for rooting the cuttings. If western white pine cuttings can be rooted, materials from the 14 resistant trees will be propagated by this method as well as by grafting. Grafting and cutting propagation is being continued through the winter. Intraspecific pollinations among the resistant trees will be made next season. A $2\frac{1}{2}$ -acre arboretum site has been prepared in Randolph Creek, not far distant from the Forest Service tree nursery at Haugan, Montana, and will be used for planting such grafted or other resistant tree material propagated from cuttings, as may be ready in the 1950 season.

The Office of Blister Rust Control is heading up work on this project. Cooperation and assistance of the Forest Service is being secured in several phases of the work. The Division of Forest Pathology, already actively cooperating with various agencies in the propagation and testing of rust resistant eastern white pine, has requested cuttings from western white pines for use in special propagating tests. They may also be able to provide some manpower during the pollinating season.

Publications

"Development of a Blister Rust Control Policy for the National Forests in the Inland Empire" by Donald N. Matthews and S. Blair Hutchison. This comprehensive report following a 2-year study of the blister rust problem in the Inland Empire, was issued by the Forest Service in Region One in December 1948 and distributed in 1949. It points out the importance of white pine to the Inland Empire and the justification for its protection from blister rust.

SUMMARY OF PROGRESS

A summary of blister rust control activities in the Northwestern Region is presented in the following tables:

TABLE 1

SUMMARY OF RIBES ERADICATION BY STATES AND OPERATING AGENCIES - 1949

| State | Operating Agency | First Working | | | Second Working | | | Other Workings | | | All Workings | | | Per Acre | | Number of Camps | Total Seasonal Employees |
|------------|------------------|---------------|-----------------|----------|----------------|-----------------|----------|----------------|-----------------|----------|--------------|-----------------|----------|----------|----------|-----------------|--------------------------|
| | | Acres | Destroyed Ribes | Man-Days | Acres | Destroyed Ribes | Man-Days | Acres | Destroyed Ribes | Man-Days | Acres | Destroyed Ribes | Man-Days | Ribes | Man-Days | | |
| Idaho | BEPQ | 690 | 42,000 | 490 | 5,280 | 169,000 | 4,930 | 3,710 | 70,000 | 2,300 | 9,680 | 281,000 | 7,720 | 29 | .80 | 7 | 243 |
| | FS | 4,170 | 513,000 | 4,710 | 10,010 | 269,000 | 7,340 | 20,790 | 335,000 | 14,720 | 34,970 | 1,117,000 | 26,770 | 32 | .77 | 21 | 827 |
| | Subtotal | 4,860 | 555,000 | 5,200 | 15,290 | 438,000 | 12,270 | 24,500 | 405,000 | 17,020 | 44,650 | 1,398,000 | 34,490 | 31 | .77 | 28 | 1,070 |
| Montana | FS | 2,670 | 401,000 | 4,680 | 1,740 | 56,000 | 1,620 | 90 | 6,000 | 130 | 4,500 | 463,000 | 6,430 | 103 | 1.43 | 4 | 210 |
| | NPS | 370 | 137,000 | 845 | 150 | 25,000 | 224 | 200 | 20,000 | 272 | 720 | 182,000 | 1,341 | 252 | 1.86 | 1 | 27 |
| | Subtotal | 3,040 | 538,000 | 5,525 | 1,890 | 81,000 | 1,844 | 290 | 26,000 | 402 | 5,220 | 645,000 | 7,771 | 124 | 1.49 | 5 | 237 |
| Washington | FS | 80 | 50,000 | 300 | 90 | 7,000 | 40 | 470 | 95,000 | 710 | 640 | 152,000 | 1,050 | 238 | 1.64 | 2 | 36 |
| | NPS | | | | 360 | 20,000 | 328 | 180 | 25,000 | 244 | 540 | 45,000 | 572 | 84 | 1.06 | 1 | 10 |
| | Subtotal | 80 | 50,000 | 300 | 450 | 27,000 | 368 | 650 | 120,000 | 954 | 1,180 | 197,000 | 1,622 | 167 | 1.37 | 3 | 46 |
| Wyoming | NPS | 1,820 | 405,000 | 1,900 | 80 | 1,000 | 39 | | | | 1,900 | 406,000 | 1,939 | 214 | 1.02 | 1 | 39 |
| All States | BEPQ | 690 | 42,000 | 490 | 5,280 | 169,000 | 4,930 | 3,710 | 70,000 | 2,300 | 9,680 | 281,000 | 7,720 | 29 | .80 | 7 | 243 |
| | FS | 6,920 | 964,000 | 9,690 | 11,840 | 332,000 | 9,000 | 21,350 | 436,000 | 15,560 | 40,110 | 1,732,000 | 34,250 | 43 | .85 | 27 | 1,073 |
| | NPS | 2,190 | 542,000 | 2,745 | 590 | 46,000 | 591 | 380 | 45,000 | 516 | 3,160 | 633,000 | 3,852 | 200 | 1.22 | 3 | 76 |
| | Total | 9,800 | 1,548,000 | 12,925 | 17,710 | 547,000 | 14,521 | 25,440 | 551,000 | 18,376 | 52,950 | 2,646,000 | 45,822 | 50 | .87 | 37 | 1,392 |

TABLE 2

ACREAGE WORKED BY LAND OWNERSHIP - 1949

| Land Ownership | First Working Acres | Second Working Acres | Other Workings Acres | All Workings Acres |
|--------------------------|---------------------|----------------------|----------------------|--------------------|
| National Forest Region 1 | 6,070 | 11,860 | 16,860 | 34,790 |
| National Park | 2,190 | 590 | 380 | 3,160 |
| Public Domain | | | 210 | 210 |
| State and Private | 1,540 | 5,260 | 7,990 | 14,790 |
| Total | 9,800 | 17,710 | 25,440 | 52,950 |

TABLE 3

SUMMARY OF EXPENDITURES - FEDERAL AND COOPERATIVE - 1949

| State | Federal Funds | | | | | Cooperative Funds | | | Total All Funds | Expenditures Ribes Eradication |
|-------|------------------------------------|----------|-------------------|-----------------|---------------------------|-------------------|-----------------|---------------------------------------|--------------------|--------------------------------------|
| | Entomology and Plant Quarantine | | Forest Service | Park Service | Total Federal Funds | Direct Aid | Indirect Aid | Total (Direct and Indirect Aid) | | |
| | W-a.14 | W-e.14 | | | | | | | | |
| Idaho | \$ 95,700 | \$99,452 | \$726,066 | | \$ 921,218 | \$36,020 | \$2,000 | \$38,020 | \$ 959,238 | \$ 816,265 |
| Mont. | 16,380 | | 178,915 | \$30,506 | 225,801 | | 1,000 | 1,000 | 226,801 | 199,348 |
| Wash. | 16,113 | | 30,765 | 11,901 | 58,779 | | 1,000 | 1,000 | 59,779 | 40,613 |
| Colo. | 1,800 | | | | 1,800 | | 200 | 200 | 2,000 | |
| Wyo. | 4,734 | | | 33,828 | 38,562 | | | | 38,562 | 33,828 |
| Total | \$134,727 | \$99,452 | \$935,746 | \$76,235 | \$1,246,160 | \$36,020 | \$4,200 | \$40,220 | \$1,286,380 | \$1,090,054 |

TABLE A

STATUS OF RIBES ERADICATION BY STATES - ALL OWNERSHIPS, DECEMBER 31, 1949
Accumulative Series - Net

| State | Total Acres | | First Working | | Second Working | Other Workings | On Maintenance | | Remaining Work | |
|------------|-------------|---------------------------------|---------------|---------|----------------|----------------|----------------|---------|----------------|------------------------|
| | White Pine | Control Area (Wh.P.& Prot.Zone) | Acres | Percent | Acres | Acres | Acres | Percent | Unworked Acres | Requiring Rework Acres |
| Idaho | 1,928,000 | 2,255,000 | 1,509,000 | 67 | 449,000 | 158,000 | 491,000 | 22 | 746,000 | 1,018,000 |
| Montana | 205,140 | 213,140 | 145,140 | 68 | 21,619 | 8,569 | 80,846 | 38 | 68,000 | 64,294 |
| Washington | 142,100 | 153,100 | 117,100 | 76 | 45,900 | 24,880 | 34,000 | 22 | 36,000 | 83,100 |
| Wyoming | 9,600 | 9,600 | 9,200 | 96 | 1,558 | 152 | 5,580 | 58 | 400 | 3,620 |
| Colorado | 6,000 | 6,000 | | | | | | | 6,000 | |
| Total | 2,290,840 | 2,636,840 | 1,780,440 | 68 | 518,077 | 191,601 | 611,426 | 23 | 856,400 | 1,169,014 |

TABLE B

SUMMARY OF STATUS OF RIBES ERADICATION BY LAND OWNERSHIP, DECEMBER 31, 1949
Accumulative Series - Net

| Land Ownership | Total Acres | | First Working | | Second Working | Other Workings | On Maintenance | | Remaining Work | |
|-------------------------|-------------|---------------------------------|---------------|---------|----------------|----------------|----------------|---------|----------------|------------------------|
| | White Pine | Control Area (Wh.P.& Prot.Zone) | Acres | Percent | Acres | Acres | Acres | Percent | Unworked Acres | Requiring Rework Acres |
| National Forests R-1 | 1,195,000 | 1,405,000 | 1,070,000 | 76 | 307,000 | 100,000 | 354,000 | 25 | 335,000 | 716,000 |
| National Parks | 24,840 | 24,840 | 18,440 | 74 | 9,077 | 12,601 | 11,426 | 47 | 6,400 | 7,014 |
| Public Domain | 21,000 | 30,000 | 17,000 | 57 | 6,000 | 3,000 | 7,000 | 23 | 13,000 | 10,000 |
| Subtotal - Interior | 45,840 | 54,840 | 35,440 | 65 | 15,077 | 15,601 | 18,426 | 34 | 19,400 | 17,014 |
| State and Private Lands | 1,050,000 | 1,177,000 | 675,000 | 57 | 196,000 | 76,000 | 239,000 | 20 | 502,000 | 436,000 |
| Total | 2,290,840 | 2,636,840 | 1,780,440 | 68 | 518,077 | 191,601 | 611,426 | 23 | 856,400 | 1,169,014 |

COOPERATIVE BLISTER RUST CONTROL ON STATE AND PRIVATE LANDS

Herman E. Swanson, Regional Leader

Calendar Year 1949

The cooperative blister rust control program on state and private lands in the State of Idaho was administered by the Bureau of Entomology and Plant Quarantine in cooperation with the State of Idaho and the Clearwater, Potlatch, and Priest Lake Timber Protective Associations. The federal, state and private funds allotted to this work in recent years have made it possible to reach but very little of the good state and private white pine lands which require immediate control work to prevent further damage to the stands.

Through field conferences and discussions with officials of the State of Idaho and the Timber Protective Associations, attention is being directed to the serious losses occurring in the stands and also to the value of the accomplishments of control even under a small program. For example, a 1949 survey on a 1,100-acre tract of intermingled state and private lands near Pierce, Idaho, supporting white pine 50 years old showed 42 percent blister rust damage before protection from blister rust was completed. With an original potential stumpage of 34 million board feet at 120 years, the yield will be only 20 million after subtracting blister rust losses. Charging all blister rust costs on the area to the 20 million board feet which has been saved, the average cost is \$0.50 per MBF which includes \$0.44 for initial working and rework and \$0.06 for future maintenance. Ribes eradication in stands of this age is less costly than the work in younger classes.

All efforts possible under the present program are being made to complete protection in the units containing the best pole size and reproduction stands. Within these units also where mature stands are present, operators are encouraged to follow cutting practices which will minimize the ribes problem and insure an abundant regeneration of white pine seedlings. This concentration of growing and protecting white pine will produce substantial timber volumes even under a small blister rust control program.

Chemical eradication of ribes on cutover lands in state and private ownership looks very promising. Good results have already been obtained, but new equipment, especially the turbine blower, may revolutionize the method of attacking cutover areas where logging roads and cat trails are present.

Descriptions of the cooperative work on the Clearwater, Potlatch, and Priest Lake Timber Protective Associations are to be found in the Clearwater, St. Joe, and Kaniksu operation reports. A summary of the 1949 cooperative program follows.

1. Allotments

| <u>Agency</u> | <u>Fiscal Year 1949</u> | <u>Fiscal Year 1950*</u> |
|--------------------|-------------------------|--------------------------|
| Federal (BEPQ) | \$111,000 | \$107,350 |
| State of Idaho | 20,000 | 25,000 |
| Clearwater T.P.A. | 6,531 | 6,530 |
| Potlatch T.P.A. | 5,430 | 5,430 |
| Priest Lake T.P.A. | 4,055 | 4,055 |
| Total | \$147,016 | \$148,365 |

*Approximate

2. Field Program and Expenditures - Calendar Year 1949

| <u>Operation</u> | <u>Number Camps</u> | <u>Number Workers</u> | <u>State and Private Funds</u> | <u>Federal Funds</u> | <u>Total Funds</u> |
|-----------------------|-------------------------|---------------------------|------------------------------------|--------------------------|------------------------|
| Clearwater | 3 | 101 | \$14,097 | \$43,022 | \$ 57,119 |
| St. Joe (Potlatch) | 3 | 115 | 11,702 | 44,473 | 56,175 |
| Kaniksu (Priest Lake) | <u>1</u> | <u>27</u> | 10,221 | 11,957 | 22,178 |
| Total | 7 | 243 | \$36,020 | \$99,452 | \$135,472 |

Notes: (1) Kaniksu (Priest Lake) includes \$4,586 of contract work.

(2) Division of State and Private funds for 1949.

State of Idaho \$20,003, T.P.A. \$16,017; for period 1928-1948, State of Idaho \$263,499, T.P.A. \$215,223, Total \$478,722.

3. Cooperative Ribes Eradication in Idaho, 1949

| <u>Operation</u> | <u>Initial Work Acres</u> | <u>Rework Acres</u> | <u>Total Worked Acres</u> | <u>Man- Days</u> | <u>Ribes</u> | <u>Per Acre Man- Days</u> | <u>Ribes</u> |
|------------------|-----------------------------------|-------------------------|-----------------------------------|----------------------|----------------|-----------------------------------|--------------|
| Clearwater | 690 | 2,110 | 2,800 | 2,740 | 187,000 | .98 | 67 |
| St. Joe | - | 5,390 | 5,390 | 3,870 | 63,000 | .72 | 12 |
| Kaniksu | - | 1,490 | 1,490 | 1,110 | 31,000 | .74 | 21 |
| Total | 690 | 8,990 | 9,680 | 7,720 | 281,000 | .80 | 29 |

4. State and Private Lands Worked, 1949

| <u>State</u> | <u>First Working Acres</u> | <u>Second Working Acres</u> | <u>Third Working Acres</u> | <u>Total Worked Acres</u> |
|--------------|------------------------------------|-------------------------------------|------------------------------------|-----------------------------------|
| Idaho | 1,540 | 5,260 | 7,840 | 14,640 |
| Washington | - | - | 150 | 150 |
| Total | 1,540 | 5,260 | 7,990 | 14,790 |

5. Net Progress on State and Private Lands, 1923-1949.

| <u>State</u> | <u>First Working Acres</u> | <u>Second Working Acres</u> | <u>Third Working Acres</u> | <u>Maintenance Acres</u> | <u>Unworked Acres</u> | <u>Control Area Total Acres</u> |
|--------------|------------------------------------|-------------------------------------|------------------------------------|------------------------------|---------------------------|-------------------------------------|
| Idaho | 632,000 | 181,000 | 69,000 | 218,000 | 482,000 | 1,114,000 |
| Montana | 20,000 | 3,000 | 2,000 | 14,000 | 15,000 | 35,000 |
| Washington | 23,000 | 12,000 | 5,000 | 7,000 | 5,000 | 28,000 |
| Total | 675,000 | 196,000 | 76,000 | 239,000 | 502,000 | 1,177,000 |

REGIONAL SUMMARY FOR NATIONAL FOREST OPERATIONS

Calendar Year 1949

G. M. DeJarnette, Forester in Charge
Blister Rust Control, U.S.F.S., Region One

The individual operations' reports prepared jointly by the Bureau and Forest Service men in charge of the six operations involving National Forest units include the pertinent details concerning them. The discussion which follows summarizes the Regional situation briefly with respect to some of the major parts of the action program and points out the direction we are taking in shaping up the program for National Forest lands.

In general, the past season was one of the best in the history of the project with respect to accomplishment. On the whole, the quality of labor was better than at any time since prewar days. The average age of men recruited was higher, the men worked better, and turnover was less. A general tightening of supervision all along the line resulted in better weeding of the gold bricks and the unfit either by quitting or discharge.

The drive to reduce both over-all and man-day costs is continuing. Progress was made in contracting, chemical methods, and in the application of the one-man method. The latter offers the most promising means for improving production and at the same time improving the quality of hand eradication work with hired crews of any innovation of recent times. The Clearwater adaptation of individual acre block assignments and a rating scheme based on both amount and quality of work per man, per crew, and per camp is considered an excellent application of the scheme. It is being seriously considered for application on a Region-wide basis.

The six-day week has resulted in much greater effectiveness of all crews and is a very definite forward step in cost reduction.

Controlled burning to reduce eradication costs was done on two forests. On the Kaniksu, a heavy concentration of ribes in dense brush and heavy fuels at the head of Kalispell Creek was partially burned out. Follow-up to complete the burn is planned. The eventual cost of eradication is expected to be reduced by at least 75 percent. Following the burn, broadcast spraying of seedlings will be a matter of 1 or 2 man-days per acre versus 6 to 10 under conditions as they were - about 600 acres are involved. An area of 200 acres of extremely heavy ribes was burned out on Preston Creek on the St. Joe. A very good burn was made. Cleanup by spraying will be relatively easy. In both cases, the areas burned contained very little reproduction and the heavy ribes concentrations threatened valuable stands of planted or natural pine in high priority units. In both cases, planting will follow. White pine will be planted within the area of protection and Douglas fir, spruce, or cedar in the protection strip, according to the site. Early planting of these species is planned. White pine planting will be deferred until the area has been made safe. This policy will apply to all white pine planting. The production of white pine at Savenac and other nurseries which may be developed in the region will be correlated with the plans developed under unit analyses.

Investigation of chemical methods is moving forward under Bureau direction. As fast as new chemicals and methods of application are proven, they are put into practice on an administrative scale.

Analysis of the white pine units has been a continuing project throughout the year. A first run of these units under the scheme set up by the Matthews-Hutchison study was made last year. The need for boundary changes and better basic information was disclosed in many cases. Some revision of the specifications for the disease-stocking survey were indicated. These were worked out jointly by the Bureau, N.R.M. Station, and Division of Timber Management in the Regional Office. The survey was pushed forward into new units and "fill in" strips were run in certain units where more intensive information was needed. The project was financed by the Region. Technical direction and general supervision were again in the hands of R. T. Bingham.

Early in the summer, Don Moore, formerly in charge of the National Forest operation on the St. Joe, was transferred to the Division of Timber Management to assist in the unit analysis work. The information needed for the completion of all units to be considered in any probable program has been assembled. Re-analysis of these units is going ahead and is expected to be complete by February. Before spring we expect to have the program for National Forests set up on the basis of these analyses and shaped to fit the needs of the regional economy with respect to the production of the greatest amount of pine for the dollars expended. Community and industry dependency will be considered. Each unit analysis considers the work done, the work remaining to be done, and the timing necessary for most effective control at least cost. Each one provides for the complete integration of all phases of white pine management and represents an integral part of the whole which can be placed in or removed from a given size program without affecting other units.

The expenditures and progress in blister rust control by the U. S. Forest Service are summarized in the following tables:

1. Expenditures in 1949

| | |
|---------------|-----------|
| Clearwater | \$175,189 |
| St. Joe | 261,184 |
| Coeur d'Alene | 177,367 |
| Kaniksu | 143,091 |
| Cabinet | 94,215 |
| Kootenai | 84,700 |
| Total | \$935,746 |

2. Expenditures 1930-1949

| <u>Forest</u> | <u>Regular Funds</u> | <u>Emergency Funds</u> | <u>Total</u> |
|---------------|----------------------|------------------------|--------------|
| Clearwater | \$1,513,162 | \$ 413,455 | \$ 1,926,617 |
| St. Joe | 2,829,119 | 383,340 | 3,212,459 |
| Coeur d'Alene | 1,652,201 | 669,810 | 2,322,011 |
| Kaniksu | 1,614,670 | 458,055 | 2,072,725 |
| Kootenai | 459,482 | 28,233 | 487,715 |
| Cabinet | 652,124 | 258,477 | 910,601 |
| Total | \$8,720,758 | \$2,211,370 | \$10,932,128 |

3. Ribes Eradication by Forest Service Crews in 1949

| <u>Forest</u> | Initial | | Total | | | Per Acre | |
|---------------|-----------------|-----------------|-----------------|----------|-----------|----------|-------|
| | Worked Acres | Rework Acres | Worked Acres | Man-Days | Ribes | Man-Days | Ribes |
| Clearwater | 1,970 | 7,870 | 9,840 | 5,650 | 319,000 | .57 | 32 |
| St. Joe | 1,510 | 14,220 | 15,730 | 11,290 | 484,000 | .72 | 31 |
| Coeur d'Alene | 220 | 4,410 | 4,630 | 6,010 | 242,000 | 1.30 | 52 |
| Kaniksu | 540 | 4,870 | 5,410 | 4,870 | 224,000 | .90 | 41 |
| Cabinet | 1,640 | 840 | 2,480 | 3,700 | 192,000 | 1.49 | 77 |
| Kootenai | 1,040 | 980 | 2,020 | 2,730 | 271,000 | 1.35 | 134 |
| Total | 6,920 | 33,190 | 40,110 | 34,250 | 1,732,000 | .85 | 43 |

4. Net Progress on National Forest Lands, 1923-1949

| <u>Forest</u> | First | Second | Third | | | | |
|---------------|------------------|------------------|------------------|----------------------|-------------------|----------------|--|
| | Working Acres | Working Acres | Working Acres | Maintenance Acres | Unworked Acres | Total Acres | |
| Clearwater | 153,000 | 59,000 | 17,000 | 40,000 | 47,000 | 200,000 | |
| St. Joe | 217,000 | 95,000 | 43,000 | 70,000 | 97,000 | 314,000 | |
| Coeur d'Alene | 309,000 | 58,000 | 18,000 | 87,000 | 52,000 | 361,000 | |
| Kaniksu | 271,000 | 80,000 | 18,000 | 94,000 | 86,000 | 357,000 | |
| Cabinet | 65,000 | 10,000 | 4,000 | 31,000 | 9,000 | 74,000 | |
| Kootenai | 55,000 | 5,000 | | 32,000 | 44,000 | 99,000 | |
| Total | 1,070,000 | 307,000 | 100,000 | 354,000 | 335,000 | 1,405,000 | |

BLISTER RUST CONTROL ON NATIONAL PARKS

Herman E. Swanson, Regional Leader

Calendar Year 1949

Reports have been prepared for blister rust control in Mount Rainier, Glacier, and Yellowstone National Parks. The following discussion briefly summarizes the situation for these parks in the Northwestern Region.

In Mount Rainier, the mop-up work of the last 2 years has eradicated by the use of 2,4,5-T serious concentrations of ribes in stream bottoms and on precipitous slopes within and adjacent to the control area boundaries. As mentioned in previous reports, the blister rust damage in Rainier has been heavy, but this condition should be considerably checked by the recent ribes eliminations.

In Glacier, work is progressing very well on the important control areas and large scale work was completed in 1949. Immediate future annual requirements call for a small rework crew with a slight increase when the Oldman Lake area is due for rework.

In Yellowstone, work is practically up to schedule although fire duty shortened the 1949 season considerably. Fortunately the majority of the ribes has been eradicated on the control areas ahead of the finding of rust on pine. Infection on ribes has been found in many places in the park and also beyond the park to the east and south. The nearest known blister rust infection on white pine is in Sunlight Creek 2 miles north of the park boundary.

In view of the more efficient methods of ribes eradication recently developed, the Bureau has suggested to National Park officials that consideration be given to adding 3,500 acres to the Mount Washburn control area. This expansion would bring most of the head of the Carnelian Creek drainage representing an excellent stand of Pinus albicaulis under protection. The present control area is so small that much of it represents protection zone only. The recommended larger area, by virtue of its size and more advantageous use of topographic features as boundaries, would largely be protected area.

Expenditures and accomplishments in blister rust control are presented in the following summaries:

1. Expenditures by National Park Service

| <u>National Park</u> | <u>Calendar Year 1949</u> | <u>All Years</u> |
|----------------------|---------------------------|------------------|
| Mount Rainier | \$11,901 | \$134,684 |
| Glacier | 30,506 | 131,537 |
| Yellowstone | 33,828 | 137,182 |
| Rocky Mountain | | 742 |
| Total | \$76,235 | \$404,145 |

2. Ribes Eradication in 1949

| <u>National Park</u> | <u>First</u> | <u>Second</u> | <u>Other</u> | <u>Total</u> | | <u>Per Acre</u> | | |
|----------------------|----------------|----------------|-----------------|--------------|--------------|-----------------|--------------|-----------------|
| | <u>Working</u> | <u>Working</u> | <u>Workings</u> | | | <u>Man-Days</u> | <u>Ribes</u> | <u>Man-Days</u> |
| | <u>Acres</u> | <u>Acres</u> | <u>Acres</u> | <u>Acres</u> | <u>Acres</u> | <u>Man-Days</u> | <u>Ribes</u> | <u>Ribes</u> |
| Mount Rainier | - | 360 | 180 | 540 | 572 | 45,000 | 1.06 | 83 |
| Glacier | 370 | 150 | 200 | 720 | 1,341 | 182,000 | 1.86 | 253 |
| Yellowstone | 1,820 | 80 | - | 1,900 | 1,939 | 406,000 | 1.02 | 214 |
| Total | 2,190 | 590 | 380 | 3,160 | 3,852 | 633,000 | 1.22 | 200 |

3. Gross Acreage Worked, 1930-1949

| <u>National Park</u> | <u>First</u> | <u>Second</u> | <u>Other</u> | <u>Total</u> | | <u>Per Acre</u> | | |
|----------------------|----------------|----------------|-----------------|---------------|---------------|------------------|--------------|-----------------|
| | <u>Working</u> | <u>Working</u> | <u>Workings</u> | | | <u>Man-Days</u> | <u>Ribes</u> | <u>Man-Days</u> |
| | <u>Acres</u> | <u>Acres</u> | <u>Acres</u> | <u>Acres</u> | <u>Acres</u> | <u>Man-Days</u> | <u>Ribes</u> | <u>Ribes</u> |
| Mount Rainier | 8,263 | 4,687 | 10,100 | 23,050 | 24,608 | 2,420,000 | 1.07 | 105 |
| Glacier | 5,140 | 3,619 | 2,569 | 11,328 | 12,416 | 1,260,000 | 1.10 | 111 |
| Yellowstone | 9,200 | 1,558 | 152 | 10,910 | 8,366 | 1,150,000 | .77 | 105 |
| Total | 22,603 | 9,864 | 12,821 | 45,288 | 45,390 | 4,830,000 | 1.00 | 107 |

4. Work Status in the Net Control Area

| <u>National Park</u> | <u>First</u> | <u>Second</u> | <u>Other</u> | <u>Maintenance</u> | <u>Unworked</u> | <u>Control Area</u> |
|----------------------|----------------|----------------|-----------------|--------------------|-----------------|---------------------|
| | <u>Working</u> | <u>Working</u> | <u>Workings</u> | | | |
| | <u>Acres</u> | <u>Acres</u> | <u>Acres</u> | <u>Acres</u> | <u>Acres</u> | <u>Acres</u> |
| Mount Rainier | 4,100* | 3,900 | 9,880 | 3,000 | - | 4,100* |
| Glacier | 5,140 | 3,619 | 2,569 | 2,846 | - | 5,140 |
| Yellowstone | 9,200 | 1,558 | 152 | 5,580 | 400 | 9,600** |
| Rocky Mountain | - | - | - | - | 6,000 | 6,000** |
| Total | 18,440 | 9,077 | 12,601 | 11,426 | 6,400 | 24,840 |

* 510 acres added in 1949 as result of resurvey.

** Final acreage to be determined.

BLISTER RUST CONTROL, INLAND EMPIRE, 1949

By

Frank O. Walters

Assistant Regional Leader

Introduction.

The integration of ribes eradication methods and continued refinements of techniques are producing better results on all operations. The one-man dragline method, contracting of ribes eradication work, and chemical methods were all factors contributing to greater accomplishments.

Chemical Methods

With a killing chemical and an efficient means of application to meet varying conditions, it is now possible to combine chemical methods with hand methods to achieve lower costs. The hormone chemical 2,4,5-T kills all species of ribes in the Inland Empire and was used on all operations. Truck-mounted power sprayers were used in accessible areas to eliminate ribes concentrations in the upland and stream type. A high percentage of this work was done on recent burns and cutover areas before the pine had become established. Many such areas were treated with a broadcast spray. Last season's experience led to improvements in laying out areas and in spraying techniques. The spray nozzles were also improved. Much remains to be accomplished in developing more suitable equipment.

Hi-Fog guns and knapsack spray units were used to eradicate small scattered ribes concentrations when power units and hand pulling were not practical. Where a supply of water was available, the old knapsack units were used since they give a more complete application and a higher degree of kill.

A recent development is the use of a Buffalo turbine blower. The unit, which is mounted on a turntable, is carried on a trailer. The blower's nozzle can be turned in a complete circle, and the chemical directed at any angle. One man is required to operate the blower and one the equipment to tow it. The turbine generates a wind velocity of 150 miles per hour at the nozzle. When the chemical is introduced into the air stream, it becomes finely atomized and envelopes the brush with a fine fog-like mist. A highly concentrated chemical solution is used and only enough is applied to completely cover a given area. The unit will have its greatest use on stream type and logged over lands. Stream type can be treated when roads parallel the stream. On logged over lands, the abundant roadside ribes can be sprayed and where roads are close together, large acreages can be completely covered by spraying the intervening ground from opposite directions. Field trials show that from 3 to 8 acres an hour can be treated.

Experimental tests, using a helicopter to dispense chemical of varying concentrations, were carried on for the first time in this region. The objectives were: (1) to study the possibilities of killing heavy brush and ribes occurring on burns endangering adjacent white pine stands, (2) to determine if the dead brush could be burned, opening the site for planting. It will not be possible to accurately determine results of tests until next season.

One-Man Dragline Method

With more experience in the one-man dragline method, improvements were made which increased both output and efficiency. Charts were maintained showing production and efficiency of individual workers. By keeping a close check on efficiency and production of the workers, some operations were able to materially reduce supervisory overhead. The constant knowledge of his progress was more of an incentive to a worker than constant supervision.

The training charts were revised to cover the one-man dragline method. Special attention was given to depicting proper techniques of search and of systematically covering the ground. Supervisory personnel gave special attention to "on the job training since this is basic to successful performance under the one-man dragline method.

Ribes Eradication Contracting

Contracts were awarded on five of the six operations. On the Coeur d'Alene and Kaniksu, a substantial part of the work was accomplished under the contract system. Savings of 25 percent were estimated. Of particular significance is the fact that several isolated areas were worked under contract, eliminating the necessity of costly camp installations. On the Kaniksu and Coeur d'Alene operations, increasing numbers of workers are becoming interested, which creates competition tending to lower bid prices. When contracting becomes established on other operations, a similar development should follow.

SURVEYS

1. Checking

Checking was generally organized to aid ribes eradication work. Checkers assisted in laying out work lanes and marking off the lots. Checks were made by individual lots and were kept close to the current work, so that workers could be constantly informed as to the efficiency of their work. All operations carried on post check when possible. This phase of the work, postponed during and immediately after the war, is gradually being brought up to date.

2. Mt. Spokane Stocking-Rust Damage Survey

A survey was run on lands in the vicinity of Mt. Spokane and in Spirit Creek in October to determine the status of this area. Control work on these lands was discontinued with the end of the WPA program. The results of the survey show the need for properly timed workings in young stands until a stabilized vegetative cover has become established. Damage to reproduction over much of the area is too high to warrant further control efforts. It appears that the older pole stands on Mt. Spokane have been given sufficient protection to bring them through to maturity.



The Buffalo turbine blower operating on cutover areas.

W-670

3. Stocking-Blister Rust Damage Survey

Data secured on the basis of the comprehensive stocking-blister rust damage surveys helped determine the economic feasibility of growing pine on units set up for control, as well as the general suitability of the unit. The surveys carried on during the past 2 years are nearing completion.

All data including stocking, site, incident of the disease, working conditions, ultimate yield, and cost of establishing complete control are analyzed to determine if white pine can be profitably grown on a given unit. In the analysis of National Forest lands, control and management plans are built up for each acceptable unit. Long range objectives in the management of a unit call for the maximum possible yield of white pine in each selected unit by capturing mortality through early and continued cuttings, fill-in plantings, growing white pine on all ground that will support it, and suppression of ribes over the entire unit through silvicultural practices. The units are arranged in priority of value and protected accordingly. Units which do not meet prescribed standards are not considered for control.

SUMMARY OF PROGRESS BY OPERATIONS

Clearwater Operation

Under the Bureau of Entomology and Plant Quarantine cooperative program, work was conducted on lands in the Clearwater Timber Protective Association. Control work was carried on in the well stocked cutover lands in the vicinity of C. T. P. A. Headquarters and in Rhodes Creek. Ribes were generally heavy in both areas and reworkings will be necessary. All initial work was completed in the Hildebrand drainage where a high quality work was secured. Since ribes populations were originally light on much of the area, the rework load will not be difficult. Work was completed on the pole stands in the vicinity of Pierce, and no future work will be necessary unless logging disturbances occur. A truck-mounted power spray unit was effectively used to do broadcast spraying on areas of numerous small ribes in Hildebrand Creek and Rhodes Creek.

The Forest Service carried on protective work in pole stands and cutover lands in Orofino Creek and Musselshell drainages. The work was speeded up by roadside spraying operations in cutover areas in the Orofino Creek unit. Work was carried on in plantations in Sylvan Creek and in the vicinity of Musselshell Administrative Site. The fine pole stands in the Tamarack and Sylvan drainages were given a final working. The objectives on the National Forest lands are to protect extensive pole stands and to keep ribes eradication in pace with the accelerated cutting of white pine stands, so these lands may continue to produce white pine.

St. Joe Operation

Bureau cooperative work was carried on in the Hog Meadows, Corral Creek units, and the upper portion of the Cougar Creek unit. These units represent extensive mediumly stocked reproduction stands which are still filling in and it appears that complete stocking will eventually result. Twenty-five percent of the area worked in the Hog Meadows and Corral units was placed on maintenance.

Additional work is planned for these units in 1950. All current work was completed on the Cougar Creek unit and 50 percent of this year's work was placed on maintenance. All future work will be determined on the basis of post checks.

Forest Service personnel worked in the extensive pole stands in the Palouse division and in the vicinity of Clarkia and the Emida Camp. It was expected that most of the pole could be placed on maintenance, but because of soil disturbances resulting from blowdown and snow damage to the timber, most of it must be held in the post check category.

Effective work was accomplished with a power spray unit in destroying ribes on cutover areas along the Palouse River which were a hazard to pole stands across the river.

Kaniksu Operation

The Bureau cooperative program was confined to the Fox Creek and Big Creek units. Regular labor completed the work needed in reproduction areas in lower Big Creek. Highly efficient work was obtained and future work in this portion of the unit will be determined on the basis of post checks. Future work in this unit will be carried on under the contract system. Six contracts were awarded in the Fox Creek unit; four were completed in 1949, extensions were granted on two. All work in this unit will be completed next year by contractors. All completed contract areas met maintenance standards.

Forest Service crews working in Fedar Creek completed work in this unit, placing it on maintenance. Reproducing cutover lands in the vicinity of the Boswell and Pelke Administrative Sites were worked; ribes regeneration is still occurring on these areas and future work will be necessary.

Hand spraying in the vicinity of Hungry Mountain and power units on Diamond Peak were utilized to eliminate heavy ribes concentrations in order to protect the extensive plantations below in the Kalispell drainage.

Most of the currently needed work in reproduction and plantations in the lower West Branch Unit was completed by contractors.

Coeur d'Alene Operation

Protection was afforded to reproduction and plantation areas in Brett Creek, Upper Independence Creek, Jordan Creek, Hudlow Creek, and Cathedral. The Coeur d'Alene Forest has the most extensive and solid blocks of white pine plantations in the region; to date protection has been adequate and every effort is being made to meet necessary rework schedules. Pole stands were worked in Upper Deception Creek and along Iron Creek. Work was continued on the large Riley Creek unit of pole timber. Two more seasons' work will be needed to place the bulk of this unit on maintenance.

A power sprayer, Hi-Fog guns, and knapsack units were used to destroy heavy ribes concentrations in the Packsack Ridge area. These ribes were a menace to the plantations in Senator Creek and portions of the Brett Creek drainage. Contractors worked plantations and reproduction areas in Snowbird, Senator Creek, Brett Creek, and Nicholas Creek. Future work in these drainages will be carried on by contractors.

Cabinet Operation

Work was continued in Martin Creek. White pine reproduction occurs throughout the entire drainage and it is necessary to eliminate heavy ribes concentrations in the upper portions of the area to protect the adjacent pine and the extensive pine areas below. Hi-Fog guns, knapsack units, and a power sprayer were well integrated with hand methods to work difficult areas. Long leads of main line from the power sprayer were strung down into Martin Creek from the ridge road making it possible to spray heavy ribes concentrations. In the lower portions of the drainage, maintenance conditions have been achieved, but future rework will be required in the upper part. Only a short season's work remains to complete initial work in this drainage. All but 25 acres of initial work was completed in the plantations and reproduction stands in Robin Run Creek. Only limited parts of this drainage will require future workings. Work was initiated in the White Pine Creek drainage which comprises extensive areas of planted pine. Initial work was not completed during 1949 because of fire duty. Only a small amount of work remains.

Kootenai Operation

Work was completed in the Spar Lake unit. The area comprises 9,000 acres of predominately excellent pole timber. As a result of this year's work, over 60 percent of the unit is now on a maintenance basis.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures is shown in the following table.

TABLE 1

CLASSIFIED EXPENDITURES IN INLAND EMPIRE, 1949

| Item | Bureau of Entomology and Plant Quarantine | | | | | Forest Service BLR-4 | Total |
|----------------------|---|---------------------|--------------------|-----------|-----------|-------------------------|-------------|
| | BLR-1-4 | Cooperative Control | | | Total | | |
| | | Federal BLR-3-4 | State & Private | Total | | | |
| Contract ribes erad. | | \$ 5,056 | | \$ 5,056 | \$ 5,056 | \$ 36,125 | \$ 41,181 |
| Salary perm. men | \$45,906 | 4,460 | \$ 2,165 | 6,625 | 52,531 | 56,584 | 109,115 |
| Salary temp. men | 158 | 17,473 | 14,786 | 32,259 | 32,417 | 76,686 | 109,103 |
| Wages temp. labs. | 540 | 53,805 | 19,068 | 72,873 | 73,413 | 522,362 | 595,775 |
| Subs. supplies | 2,978 | 12,874 | | 12,874 | 15,852 | 132,817 | 148,669 |
| Equipment | 878 | 155 | | 155 | 1,033 | 27,048 | 28,081 |
| Travel and transp. | 4,087 | 1,538 | | 1,538 | 5,625 | 30,100 | 35,725 |
| Other expenses | 5,414 | 4,091 | | 4,091 | 9,505 | 54,021 | 63,526 |
| Total | \$59,961 | \$99,452 | \$36,019 | \$135,471 | \$195,432 | \$935,743 | \$1,131,175 |

TABLE 2
SUMMARY OF RIBES ERADICATION, 1949
INLAND EMPIRE

| Working | Eradication Type | Year of Origin | Acres | Man-Days | Ribes | Per Acre | |
|-------------|------------------|----------------|--------|----------|-----------|----------|-------|
| | | | | | | Man-Days | Ribes |
| First | Plantation | 1945-49 | 350 | 390 | 11,000 | 1.11 | 31 |
| | Cutover | 1945-49 | 1,570 | 1,170 | 203,000 | .75 | 129 |
| | Cutover | 1940-44 | 970 | 880 | 110,000 | .91 | 113 |
| | Cutover | 1920-39 | 30 | 70 | 7,000 | 2.33 | 233 |
| | Reproduction | 1910-39 | 1,970 | 3,190 | 211,000 | 1.62 | 107 |
| | Pole | | 2,130 | 3,060 | 273,000 | 1.44 | 128 |
| | Mature | | 120 | 400 | 69,000 | 3.33 | 575 |
| | Stream | | 470 | 1,020 | 122,000 | 2.17 | 260 |
| Second | Total | | 7,610 | 10,180 | 1,006,000 | 1.34 | 132 |
| | Plantation | 1945-49 | 50 | 30 | 1,000 | .60 | 20 |
| | Cutover | 1945-49 | 180 | 270 | 28,000 | 1.50 | 156 |
| | Plantation | 1940-44 | 360 | 310 | 20,000 | .86 | 56 |
| | Cutover | 1940-44 | 1,260 | 1,920 | 123,000 | 1.52 | 98 |
| | Cutover | 1920-39 | 920 | 980 | 18,000 | 1.07 | 20 |
| | Reproduction | 1910-39 | 6,900 | 5,800 | 167,000 | .84 | 24 |
| | Pole | | 6,790 | 3,830 | 103,000 | .56 | 15 |
| Third | Mature | | 210 | 190 | 13,000 | .90 | 62 |
| | Stream | | 450 | 600 | 23,000 | 1.33 | 62 |
| | Total | | 17,120 | 13,930 | 501,000 | .81 | 29 |
| | Plantation | 1945-49 | 380 | 520 | 30,000 | 1.37 | 79 |
| | Plantation | 1940-44 | 20 | 40 | 1,000 | 2.00 | 50 |
| | Cutover | 1940-44 | 390 | 290 | 35,000 | .74 | 90 |
| | Cutover | 1920-39 | 2,310 | 1,510 | 48,000 | .65 | 21 |
| | Reproduction | 1910-39 | 6,080 | 6,540 | 128,000 | 1.08 | 21 |
| Total | Pole | | 13,370 | 6,950 | 172,000 | .52 | 13 |
| | Mature | | 780 | 160 | 2,000 | .21 | 3 |
| | Stream | | 1,730 | 1,850 | 90,000 | 1.07 | 52 |
| | Total | | 25,060 | 17,860 | 506,000 | .71 | 20 |
| GRAND TOTAL | | | 49,790 | 41,970 | 2,013,000 | .84 | 40 |

Chemical Work Included Above:

| Working | Acres | Man-Days | Gallons Spray |
|---------|-------|----------|---------------|
| First | 700 | 1,470 | 27,000 |
| Second | 330 | 440 | 13,000 |
| Third | 310 | 420 | 20,000 |
| Total | 1,390 | 2,330 | 60,000 |

TABLE 3
SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1949
INLAND EMPIRE

| State | Working | Class | Acres | Man-Days | Ribes | Gallons Spray | Per Acre | |
|------------|--------------|----------|--------|----------|-----------|---------------|----------|-------|
| | | | | | | | Man-Days | Ribes |
| Idaho | First | EQ-Coop. | 690 | 490 | 42,000 | 50 | .71 | 61 |
| | | FS-Reg. | 4,170 | 4,710 | 513,000 | 19,460 | 1.13 | 123 |
| | | Total | 4,860 | 5,200 | 555,000 | 19,510 | 1.07 | 114 |
| | Second | EQ-Coop. | 5,280 | 4,930 | 169,000 | 9,800 | .93 | 32 |
| | | FS-Reg. | 10,010 | 7,340 | 269,000 | 3,000 | .73 | 27 |
| | | Total | 15,290 | 12,270 | 438,000 | 12,800 | .80 | 29 |
| | Third | EQ-Coop. | 3,710 | 2,300 | 70,000 | 200 | .62 | 19 |
| | | FS-Reg. | 20,790 | 14,720 | 335,000 | 2,800 | .71 | 16 |
| | | Total | 24,500 | 17,020 | 405,000 | 3,000 | .69 | 17 |
| | All Workings | EQ-Coop. | 9,680 | 7,720 | 281,000 | 10,050 | .80 | 29 |
| | | FS-Reg. | 34,970 | 26,770 | 1,117,000 | 25,260 | .77 | 32 |
| | | Total | 44,650 | 34,490 | 1,398,000 | 35,310 | .77 | 31 |
| Montana | First | FS-Reg. | 2,670 | 4,680 | 401,000 | 5,740 | 1.75 | 150 |
| | Second | FS-Reg. | 1,740 | 1,620 | 56,000 | | .93 | 32 |
| | Third | FS-Reg. | 90 | 130 | 6,000 | 300 | 1.44 | 67 |
| | All Workings | FS-Reg. | 4,500 | 6,430 | 463,000 | 6,040 | 1.43 | 103 |
| Washington | First | FS-Reg. | 80 | 300 | 50,000 | 1,750 | 3.75 | 625 |
| | Second | FS-Reg. | 90 | 40 | 7,000 | 200 | .44 | 78 |
| | Third | FS-Reg. | 470 | 710 | 95,000 | 16,700 | 1.51 | 202 |
| | All Workings | FS-Reg. | 640 | 1,050 | 152,000 | 18,650 | 1.64 | 235 |
| Total | First | EQ-Coop. | 690 | 490 | 42,000 | 50 | .71 | 61 |
| | | FS-Reg. | 6,920 | 9,690 | 964,000 | 26,950 | 1.40 | 139 |
| | | Total | 7,610 | 10,180 | 1,006,000 | 27,000 | 1.34 | 132 |
| | Second | EQ-Coop. | 5,280 | 4,930 | 169,000 | 9,800 | .93 | 32 |
| | | FS-Reg. | 11,840 | 9,000 | 332,000 | 3,200 | .76 | 28 |
| | | Total | 17,120 | 13,930 | 501,000 | 13,000 | .81 | 29 |
| | Third | EQ-Coop. | 3,710 | 2,300 | 70,000 | 200 | .62 | 19 |
| | | FS-Reg. | 21,350 | 15,560 | 436,000 | 19,800 | .73 | 20 |
| | | Total | 25,060 | 17,860 | 506,000 | 20,000 | .71 | 20 |
| | All Workings | EQ-Coop. | 9,680 | 7,720 | 281,000 | 10,050 | .80 | 29 |
| | | FS-Reg. | 40,110 | 34,250 | 1,732,000 | 49,950 | .85 | 43 |
| | | Total | 49,790 | 41,970 | 2,013,000 | 60,000 | .84 | 40 |

Contract Work Included Above:

| Working | Bureau of Entomology and Plant Quarantine | | | Forest Service | | |
|---------|---|----------|-------|----------------|----------|--------|
| | Acres | Man-Days | Ribes | Acres | Man-Days | Ribes |
| Second | 40 | 70 | 3,000 | 920 | 690 | 33,000 |
| Third | 430 | 250 | 2,000 | 1,650 | 1,650 | 30,000 |
| Total | 470 | 320 | 5,000 | 2,570 | 2,340 | 63,000 |

TABLE 4

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1949
INLAND EMPIRE

| State | Working | Number of Acres Worked | | | | | | | | | | | | | | | |
|------------|---------|------------------------|---------------|-------|---------|--------|--|-------|---------|-------|-----------------|---------------|--------|-------------|---------|--------|-------------|
| | | By Forest Service | | | | | By Bureau of Entomology and Plant Quarantine | | | | Total Federal | | | Total Other | | | GRAND TOTAL |
| | | National Forest | Public Domain | State | Private | Total | National Forest | State | Private | Total | National Forest | Public Domain | Total | State | Private | Total | |
| Idaho | First | 3,290 | | | 880 | 4,170 | 30 | 250 | 410 | 690 | 3,320 | | 3,320 | 250 | 1,290 | 1,540 | 4,860 |
| | Second | 7,970 | | 560 | 1,480 | 10,010 | 2,060 | 1,830 | 1,390 | 5,280 | 10,030 | | 10,030 | 2,390 | 2,870 | 5,260 | 15,290 |
| | Third | 16,230 | 210 | 480 | 3,870 | 20,790 | 220 | 1,510 | 1,980 | 3,710 | 16,450 | 210 | 16,660 | 1,990 | 5,850 | 7,840 | 24,500 |
| | Total | 27,490 | 210 | 1,040 | 6,230 | 34,970 | 2,310 | 3,590 | 3,780 | 9,680 | 29,800 | 210 | 30,010 | 4,630 | 10,010 | 14,640 | 44,650 |
| Montana | First | 2,670 | | | | 2,670 | | | | | 2,670 | | 2,670 | | | | 2,670 |
| | Second | 1,740 | | | | 1,740 | | | | | 1,740 | | 1,740 | | | | 1,740 |
| | Third | 90 | | | | 90 | | | | | 90 | | 90 | | | | 90 |
| | Total | 4,500 | | | | 4,500 | | | | | 4,500 | | 4,500 | | | | 4,500 |
| Washington | First | 80 | | | | 80 | | | | | 80 | | 80 | | | | 80 |
| | Second | 90 | | | | 90 | | | | | 90 | | 90 | | | | 90 |
| | Third | 320 | | | 150 | 470 | | | | | 320 | | 320 | | 150 | 150 | 470 |
| | Total | 490 | | | 150 | 640 | | | | | 490 | | 490 | | 150 | 150 | 640 |
| Total | First | 6,040 | | | 880 | 6,920 | 30 | 250 | 410 | 690 | 6,070 | | 6,070 | 250 | 1,290 | 1,540 | 7,610 |
| | Second | 9,800 | | 560 | 1,480 | 11,840 | 2,060 | 1,830 | 1,390 | 5,280 | 11,860 | | 11,860 | 2,390 | 2,870 | 5,260 | 17,120 |
| | Third | 16,640 | 210 | 480 | 4,020 | 21,350 | 220 | 1,510 | 1,980 | 3,710 | 16,860 | 210 | 17,070 | 1,990 | 6,000 | 7,990 | 25,060 |
| | Total | 32,480 | 210 | 1,040 | 6,380 | 40,110 | 2,310 | 3,590 | 3,780 | 9,680 | 34,790 | 210 | 35,000 | 4,630 | 10,160 | 14,790 | 49,790 |

TABLE 5

RIBES SPECIES ERADICATED, 1949
INLAND EMPIRE

| Working | Eradication Type | Acres | Ribes Species | | | | | Total Ribes |
|--------------|------------------------|--------|----------------|---------------------|-----------------|--------------|-------------------|-------------|
| | | | Ribes lacustre | Ribes viscosissimum | Ribes petiolare | Ribes inerme | Ribes coloradense | |
| First | Plantation (1945-49) | 350 | 2,000 | 9,000 | | | | 11,000 |
| | Cutover (1945-49) | 1,570 | 26,000 | 161,000 | 16,000 | | | 203,000 |
| | Cutover (1940-44) | 970 | 74,000 | 35,000 | | 1,000 | | 110,000 |
| | Cutover (1920-39) | 30 | 4,000 | 3,000 | | | | 7,000 |
| | Reproduction (1910-39) | 1,970 | 106,000 | 105,000 | | | | 211,000 |
| | Pole | 2,130 | 258,000 | 13,000 | 1,000 | | 1,000 | 273,000 |
| | Mature | 120 | 67,000 | 1,000 | | | 1,000 | 69,000 |
| | Stream | 470 | 99,000 | 3,000 | 1,000 | 19,000 | | 122,000 |
| | Total | 7,610 | 636,000 | 330,000 | 18,000 | 20,000 | 2,000 | 1,006,000 |
| | | | 50 | 1,000 | | | | 1,000 |
| Second | Plantation (1945-49) | 180 | 1,000 | 27,000 | | | | 28,000 |
| | Plantation (1940-44) | 360 | 13,000 | 7,000 | | | | 20,000 |
| | Cutover (1940-44) | 1,260 | 25,000 | 97,000 | 1,000 | | | 123,000 |
| | Cutover (1920-39) | 920 | 11,000 | 7,000 | | | | 18,000 |
| | Reproduction (1910-39) | 6,900 | 91,000 | 75,000 | | 1,000 | | 167,000 |
| | Pole | 6,790 | 76,000 | 26,000 | | | 1,000 | 103,000 |
| | Mature | 210 | 13,000 | | | | | 13,000 |
| | Stream | 450 | 27,000 | 1,000 | | | | 28,000 |
| | Total | 17,120 | 258,000 | 240,000 | 1,000 | 1,000 | 1,000 | 501,000 |
| | | | 380 | 3,000 | 27,000 | | | 30,000 |
| Third | Plantation (1945-49) | 20 | 1,000 | | | | | 1,000 |
| | Cutover (1940-44) | 390 | 9,000 | 26,000 | | | | 35,000 |
| | Cutover (1920-39) | 2,310 | 27,000 | 21,000 | | | | 48,000 |
| | Reproduction (1910-39) | 6,080 | 50,000 | 73,000 | 1,000 | 4,000 | | 128,000 |
| | Pole | 13,370 | 74,000 | 97,000 | 1,000 | | | 172,000 |
| | Mature | 780 | 2,000 | | | | | 2,000 |
| | Stream | 1,730 | 79,000 | 1,000 | 6,000 | 3,000 | 1,000 | 90,000 |
| | Total | 25,060 | 245,000 | 245,000 | 8,000 | 7,000 | 1,000 | 506,000 |
| | | | 780 | 6,000 | 36,000 | | | 42,000 |
| | | | 1,750 | 27,000 | 188,000 | 16,000 | | 231,000 |
| All Workings | Plantation (1945-49) | 380 | 14,000 | 7,000 | | | | 21,000 |
| | Cutover (1940-44) | 1,520 | 108,000 | 158,000 | 1,000 | 1,000 | | 268,000 |
| | Cutover (1920-39) | 3,260 | 42,000 | 31,000 | | | | 73,000 |
| | Reproduction (1910-39) | 14,950 | 247,000 | 253,000 | 1,000 | 5,000 | | 506,000 |
| | Pole | 22,290 | 408,000 | 136,000 | 2,000 | | 2,000 | 548,000 |
| | Mature | 1,110 | 82,000 | 1,000 | | | 1,000 | 84,000 |
| | Stream | 2,650 | 205,000 | 5,000 | 7,000 | 22,000 | 1,000 | 240,000 |
| | Total | 49,790 | 1,139,000 | 815,000 | 27,000 | 28,000 | 4,000 | 2,013,000 |
| | | | | | | | | |
| | | | | | | | | |

TABLE 6

SUMMARY OF RIBES ERADICATION, 1923-1949
INLAND EMPIRE

| Working | Eradication Type | Year of Origin | Gross Acres Worked | Man-Days | Ribes | Per Acre | | Net Acreage Remaining | |
|-------------|------------------|----------------|--------------------|-----------|-------------|----------|-------|-----------------------|----------|
| | | | | | | Man-Days | Ribes | Worked | Unworked |
| First | Burn | 1940-49 | 1,000 | 1,000 | 213,000 | 1.00 | 213 | 1,000 | |
| | Plantation | 1940-49 | 8,000 | 10,000 | 2,263,000 | 1.25 | 283 | 8,000 | 1,000 |
| | Cutover | 1940-49 | 19,000 | 21,000 | 6,583,000 | 1.11 | 346 | 19,000 | 143,000 |
| | Cutover | 1920-39 | 86,000 | 84,000 | 24,858,000 | .98 | 289 | 82,000 | 241,000 |
| | Reproduction | 1910-39 | 608,000 | 685,000 | 183,402,000 | 1.13 | 302 | 597,000 | 160,000 |
| | Pole | | 375,000 | 163,000 | 28,719,000 | .43 | 77 | 370,000 | 82,000 |
| | Mature | | 709,000 | 299,000 | 63,366,000 | .42 | 89 | 527,000 | 190,000 |
| | Miscellaneous | | 37,000 | 32,000 | 8,409,000 | .86 | 227 | 34,000 | 10,000 |
| | Stream | | 126,000 | 317,000 | 65,174,000 | 2.52 | 517 | 124,000 | 23,000 |
| | Total | | 1,969,000 | 1,612,000 | 382,987,000 | .82 | 195 | 1,762,000 | 850,000 |
| Second | Plantation | 1940-49 | 6,000 | 6,000 | 414,000 | 1.00 | 69 | 6,000 | |
| | Cutover | 1940-49 | 3,000 | 4,000 | 366,000 | 1.33 | 122 | 3,000 | |
| | Cutover | 1920-39 | 58,000 | 64,000 | 13,297,000 | 1.10 | 229 | 58,000 | |
| | Reproduction | 1910-39 | 211,000 | 250,000 | 23,078,000 | 1.18 | 109 | 209,000 | |
| | Pole | | 126,000 | 68,000 | 5,240,000 | .54 | 42 | 125,000 | |
| | Mature | | 44,000 | 28,000 | 3,022,000 | .64 | 69 | 41,000 | |
| | Miscellaneous | | 5,000 | 6,000 | 918,000 | 1.20 | 184 | 5,000 | |
| | Stream | | 63,000 | 97,000 | 12,697,000 | 1.54 | 202 | 62,000 | |
| | Total | | 516,000 | 523,000 | 59,032,000 | 1.01 | 114 | 509,000 | |
| Third | Plantation | 1940-49 | 4,000 | 3,000 | 129,000 | .75 | 32 | 4,000 | |
| | Cutover | 1940-49 | 1,000 | 1,000 | 36,000 | 1.00 | 36 | 1,000 | |
| | Cutover | 1920-39 | 36,000 | 36,000 | 2,166,000 | 1.00 | 60 | 36,000 | |
| | Reproduction | 1910-39 | 75,000 | 99,000 | 3,732,000 | 1.32 | 50 | 75,000 | |
| | Pole | | 35,000 | 20,000 | 726,000 | .57 | 21 | 35,000 | |
| | Mature | | 4,000 | 3,000 | 287,000 | .75 | 72 | 4,000 | |
| | Miscellaneous | | 1,000 | 1,000 | 32,000 | 1.00 | 32 | 1,000 | |
| | Stream | | 23,000 | 33,000 | 2,799,000 | 1.43 | 122 | 23,000 | |
| | Total | | 179,000 | 196,000 | 9,907,000 | 1.09 | 55 | 179,000 | |
| GRAND TOTAL | | | 2,664,000 | 2,331,000 | 451,926,000 | .88 | 170 | 2,450,000 | |

Chemical work included above:

| | Working | Acres | Man-Days | Gallons Spray |
|--------|---------|--------|----------|---------------|
| First | | 25,000 | 58,000 | 1,629,000 |
| Second | | 10,000 | 15,000 | 287,000 |
| Third | | 5,000 | 6,000 | 80,000 |
| Total | | 40,000 | 79,000 | 1,996,000 |

TABLE 7
SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1923-1949
INLAND EMPIRE

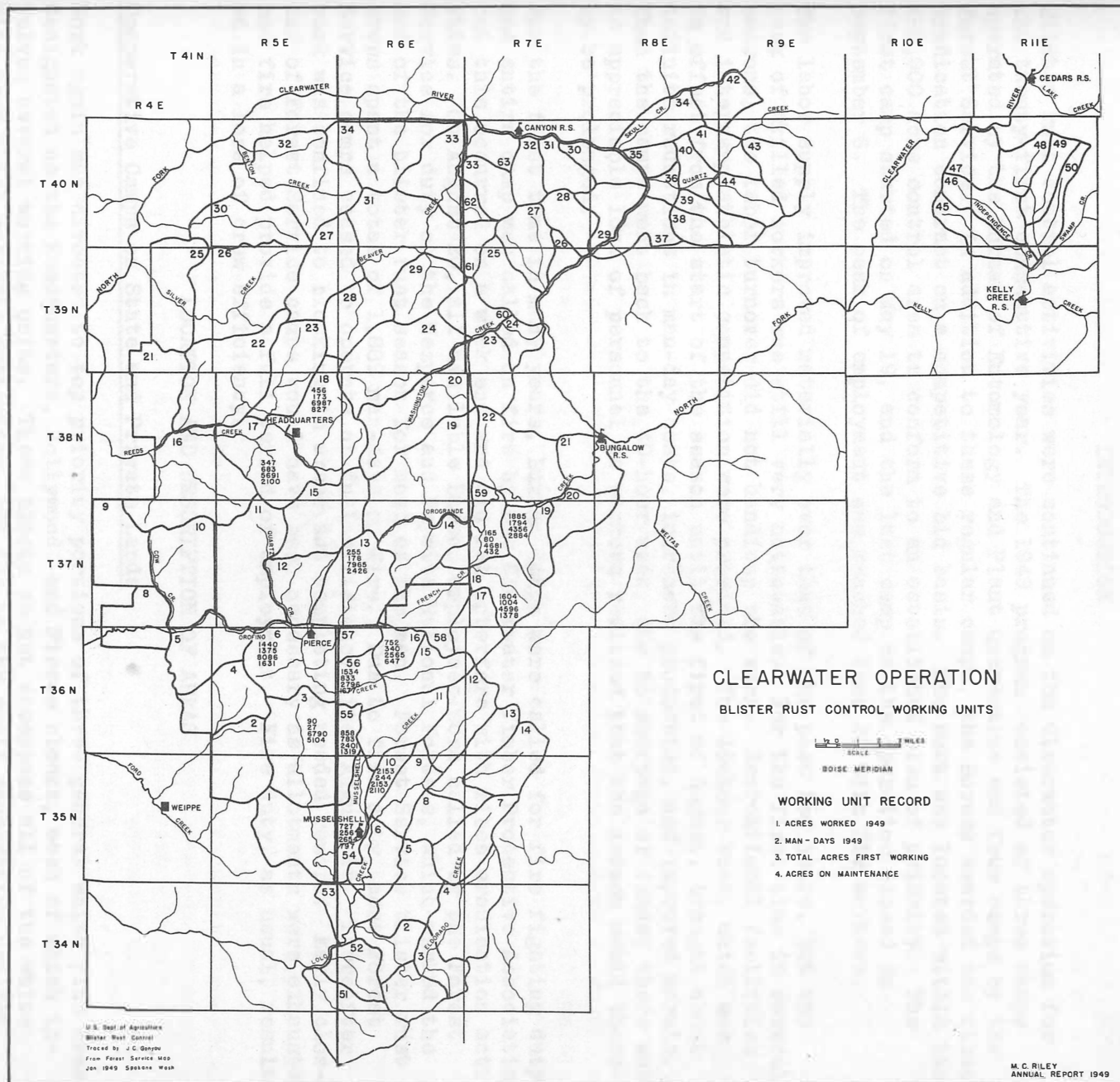
| State | Class | Gross Acres | Effective Man-Days | Total Ribes | Gallons Spray | Per Acre | |
|------------|-----------|-------------|--------------------|-------------|---------------|----------|-------|
| | | | | | | Man-Days | Ribes |
| Idaho | EQ-Reg. | 49,000 | 21,000 | 5,000,000 | 80,000 | .43 | 102 |
| | EQ-Coop. | 291,000 | 179,000 | 25,000,000 | 236,000 | .62 | 86 |
| | EQ-Emerg. | 515,000 | 404,000 | 97,000,000 | 214,000 | .78 | 188 |
| | FS-Reg. | 525,000 | 549,000 | 86,000,000 | 538,000 | 1.05 | 164 |
| | FS-Emerg. | 338,000 | 216,000 | 57,000,000 | 125,000 | .64 | 169 |
| | CCC | 591,000 | 662,000 | 124,000,000 | 657,000 | 1.12 | 210 |
| | Total | 2,309,000 | 2,031,000 | 394,000,000 | 1,850,000 | .88 | 171 |
| Montana | EQ-Reg. | 2,000 | 3,000 | 1,000,000 | 35,000 | 1.50 | 500 |
| | EQ-Emerg. | 66,000 | 31,000 | 6,000,000 | 1,000 | .47 | 91 |
| | FS-Reg. | 50,000 | 64,000 | 6,000,000 | 54,000 | 1.28 | 120 |
| | FS-Emerg. | 36,000 | 36,000 | 7,000,000 | 22,000 | 1.00 | 194 |
| | CCC | 14,000 | 12,000 | 1,000,000 | 6,000 | .86 | 71 |
| | Total | 168,000 | 146,000 | 21,000,000 | 118,000 | .87 | 125 |
| Washington | EQ-Emerg. | 65,000 | 63,000 | 18,000,000 | | .97 | 277 |
| | FS-Reg. | 64,000 | 52,000 | 12,000,000 | 28,000 | .81 | 188 |
| | FS-Emerg. | 36,000 | 14,000 | 4,000,000 | | .39 | 111 |
| | CCC | 22,000 | 25,000 | 3,000,000 | | 1.14 | 136 |
| | Total | 187,000 | 154,000 | 37,000,000 | 28,000 | .82 | 198 |
| | | | | | | | |
| Total | EQ-Reg. | 51,000 | 24,000 | 6,000,000 | 115,000 | .47 | 118 |
| | EQ-Coop. | 291,000 | 179,000 | 25,000,000 | 236,000 | .62 | 86 |
| | EQ-Emerg. | 646,000 | 498,000 | 121,000,000 | 215,000 | .77 | 187 |
| | FS-Reg. | 639,000 | 665,000 | 104,000,000 | 620,000 | 1.04 | 163 |
| | FS-Emerg. | 410,000 | 266,000 | 68,000,000 | 147,000 | .65 | 166 |
| | CCC | 627,000 | 699,000 | 128,000,000 | 663,000 | 1.11 | 204 |
| | Total | 2,664,000 | 2,331,000 | 452,000,000 | 1,996,000 | .88 | 170 |

Contract work included above:

| | | |
|-------|----------|--------|
| Acres | Man-Days | Ribes |
| 4,000 | 3,000 | 83,000 |

TABLE 8
OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1923-1949
INLAND EMPIRE

| State | Ownership | Net Acres in Control Area | | | | | |
|------------|------------------|---------------------------|---------|---------|-----------|----------------|-------------|
| | | Acres Worked | | | | Acres Unworked | Total Acres |
| | | First | Second | Third | Total | | |
| Idaho | National Forest | 860,000 | 262,000 | 86,000 | 1,208,000 | 251,000 | 1,111,000 |
| | Public Domain | 17,000 | 6,000 | 3,000 | 26,000 | 13,000 | 30,000 |
| | Subtotal Federal | 877,000 | 268,000 | 89,000 | 1,234,000 | 264,000 | 1,141,000 |
| | State | 225,000 | 68,000 | 24,000 | 317,000 | 123,000 | 348,000 |
| | Private | 407,000 | 113,000 | 45,000 | 565,000 | 359,000 | 766,000 |
| | Subtotal Other | 632,000 | 181,000 | 69,000 | 882,000 | 482,000 | 1,114,000 |
| | Total | 1,509,000 | 449,000 | 158,000 | 2,116,000 | 746,000 | 2,255,000 |
| Montana | National Forest | 120,000 | 15,000 | 4,000 | 139,000 | 53,000 | 173,000 |
| | State | 1,000 | | | 1,000 | | 1,000 |
| | Private | 19,000 | 3,000 | 2,000 | 23,000 | 15,000 | 34,000 |
| | Subtotal Other | 20,000 | 3,000 | 2,000 | 24,000 | 15,000 | 35,000 |
| | Total | 140,000 | 18,000 | 6,000 | 163,000 | 68,000 | 208,000 |
| Washington | National Forest | 90,000 | 30,000 | 10,000 | 131,000 | 31,000 | 121,000 |
| | State | 7,000 | 4,000 | 2,000 | 13,000 | 1,000 | 8,000 |
| | Private | 16,000 | 8,000 | 3,000 | 27,000 | 4,000 | 20,000 |
| | Subtotal Other | 23,000 | 12,000 | 5,000 | 40,000 | 5,000 | 28,000 |
| | Total | 113,000 | 42,000 | 15,000 | 171,000 | 36,000 | 149,000 |
| Total | National Forest | 1,070,000 | 307,000 | 100,000 | 1,477,000 | 335,000 | 1,405,000 |
| | Public Domain | 17,000 | 6,000 | 3,000 | 26,000 | 13,000 | 30,000 |
| | Subtotal Federal | 1,087,000 | 313,000 | 103,000 | 1,503,000 | 348,000 | 1,435,000 |
| | State | 233,000 | 72,000 | 26,000 | 331,000 | 124,000 | 357,000 |
| | Private | 442,000 | 124,000 | 50,000 | 616,000 | 378,000 | 820,000 |
| | Subtotal Other | 675,000 | 196,000 | 76,000 | 947,000 | 502,000 | 1,177,000 |
| | Total | 1,762,000 | 509,000 | 179,000 | 2,450,000 | 850,000 | 2,612,000 |



BLISTER RUST CONTROL, CLEARWATER OPERATION, 1949

By

M. C. Riley, Operation Supervisor

H. J. Faulkner, Assistant Operation Supervisor

B. C. Amsbaugh, Forest Officer

INTRODUCTION

Blister rust control activities were continued on the Clearwater operation for the twenty-first consecutive year. The 1949 program consisted of three camps operated by the Bureau of Entomology and Plant Quarantine and four camps by the Forest Service. In addition to these regular camps, the Bureau awarded one ribes eradication contract on a competitive bid basis. The work was located within the 488,000 acre control area to conform to an established plan of priority. The first camp started on May 19, and the last camp on the operation closed on September 6. The peak of employment was reached June 25 with 319 workers.

The labor supply improved materially over that of the past few years, but the lack of skilled workers was still very noticeable. For the first time in several seasons, the labor turnover did not handicap the work. Recreational facilities and intercamp athletic competition were provided. The 48-hour week, which was in effect from the start of the season until the first of August, brought about definite reductions in man-day costs, increased production, and improved morale. When the camps went back to the 40-hour week, due to shortage of funds, there was no appreciable loss of personnel as workers realized that the season would thereby be prolonged.

For the first time in many years, Bureau camps were called for fire fighting duty. One entire camp was called on fire by the Clearwater Timber Protective Association, but this occurred on a week end and did not interfere with ribes eradication activities. On August 20, all available Bureau employees were called by the Forest Service for duty on the Nezperce and Payette National Forests, which marked the end of the blister rust season for most of the men. Forest Service blister rust crews spent a total of 1,889 man-days on fire. Due to fire duty, most Forest Service camps ceased to operate at full efficiency after August 15. Thereafter work was confined to blocking in areas and completing needed rework. Early closing of Forest Service camps would have been necessary as allotments were exhausted and fire helped provide a full period of employment. Fire duty, as usual, resulted in a loss of crew efficiency.

LOCATION AND DESCRIPTION OF AREAS

Cooperative Camps on State and Private Lands

Work again was directed to top priority portions of three general white pine areas designated as the Headquarters, Hollywood, and Pierce blocks, each of which involves several working units. These blocks do not encompass all of the white pine area which warrants protection, but due to the small cooperative project, work is concentrated where the greatest values can be protected per dollar expended. The selection of these work areas is in accordance with the general work plan which considers such factors as intensity of disease, status of control, diversity of age classes, stocking, and accessibility of areas. In 1949, the camps were located at Blister Rust Headquarters, Rhodes Creek, and Reeds Creek.

Camp 100, BRC Headquarters. Workers from this camp completed first working, started last season, on Hildebrand Creek in the area cut over from 1940 to 1943. Ribes concentrations were comparatively light for this type of area on the Clearwater. On Hildebrand Creek, several areas varying in size from 40 to 140 acres were reworked where post check indicated that it was necessary. This was second or third working in either older cutover or pole type. Ribes concentrations and working conditions were light. To protect adjacent excellent pole stands in Canal Gulch, 225 acres cut over in 1942 were worked initially. The heavy roadside ribes populations had been reduced the previous season by applying 2,4,5-T with power spray equipment. Eighty-seven ribes were removed per acre at an expenditure of .7 man-day per acre. Initial work was started on Brown's Creek in area cut from 1941 to 1943. Because of fire duty, only 90 acres were covered, but it appears that this will be an easy area to protect. An average of 17 ribes per acre was removed at less than a half man-day per acre. Men from this camp also reworked some stream type within the pole stand adjacent to Orofino Creek near Pierce.

The area worked constitutes an important part of the Pierce block and lies adjacent to areas covered last season. The first working on Hildebrand Creek was in area where the seed source is barely adequate, and it was necessary to protect the young white pine which came in immediately following logging by eradicating the ribes as soon as they were large enough to be located by the crews. The Canal Gulch cutting was in urgent need of working as the ribes present were a definite threat to the adjacent pole stand. Work on Brown's Creek should be completed next season since this is an excellent cutting resulting in very good stocking and can be protected at a nominal cost. Portions of the area given initial working by this camp will need another coverage in three or four years. The areas given second or third working should not need further attention unless some disturbance occurs.

Camp 101, Rhodes Creek. Crews from this camp worked entirely within the Rhodes Creek drainage. Necessary second and third working was done in the 1941-43 cutover area extending from the mouth of Rhodes Creek to the National Forest boundary on the east side of the stream and to the camp site on the west side. Brush and associated vegetation are more dense here than on the majority of areas of the same age making working conditions more difficult. Small bushes, especially Ribes lacustre, are a problem. Numerous small patches of ground with heavy concentrations of R. viscosissimum were treated with Hi-Fog guns using 2,4,5-T.

Rework was completed on the lower part of the drainage, a portion of the Pierce block, until the area logged this season is ready for work. The quality of work was satisfactory but the area has been too recently disturbed to classify as being on maintenance.

Camp 102, Reeds Creek. All work performed by crews from this camp was second or third working. Work centered around the Clearwater Timber Protective Association headquarters immediately adjacent to the area worked during the past two seasons. The portion of ground south of the highway presented rather difficult working conditions because of heavy vegetation and required approximately 2 man-days to remove 110 ribes per acre. Twenty-eight acres, sprayed in 1948 with insufficient chemical, were given another working. The ground north of the highway had better working conditions and required only a half man-day per acre to remove 12 ribes per acre.

All work performed from this camp was on high priority portions of the Headquarters block. Where a considerable number of ribes was removed, the area will need further work. The ground north of the highway has very few ribes remaining but cannot yet be placed on maintenance because some ribes are still appearing due to recent disturbances.

Chemical spraying by crews from cooperative camps was performed on Mutton Gulch, Rhodes Creek, Reeds Creek, and Orofino Creek. A 5-man crew using a power sprayer applied 2,4,5-T to 53 acres of cutover area on Mutton Gulch and 13 acres of cutover on Rhodes Creek. These areas supported considerable low brush which made it difficult to search out the small R. lacustre present. The broadcast spray method was used to eliminate costly searching. After power spraying was completed, three experienced men applied 2,4,5-T using knapsack sprayers on 114 acres of stream type rework on Deer Creek and on Reeds Creek from the mouth of Calhoun Creek east to the limits of the work area. Stream type on Orofino Creek at Pierce and vicinity was sprayed. This stream type work removed the highly dangerous R. petiolare bushes which constituted a threat to several hundred acres of reproduction in cutover areas and pole stands.

One ribes eradication contract was issued by the Bureau for work on 40 acres on St. Louis Gulch. A good quality of work was secured at a saving to the Government. The contract price was \$11.75 per acre.

Forest Service Camps on Federal Lands

The Forest Service camps were located to perform work in areas of high priority as determined by the working unit analysis. Special emphasis was placed on pole-size stands and established plantations. Cutover areas due for working this season were also covered with a view to keeping work current in this type. To meet these objectives, camps were established at Musselshell, Orofino Creek, Three Bear, and Tamarack Ridge.

Camp 151, Musselshell, was occupied again this season. Initial work in cutover area and plantations was done in 1949 together with rework in pole stands in the Musselshell drainage. Some ribes germination is still taking place in the Deer Creek plantations. The Dan Lee Creek Drainage, broadcast sprayed in 1948, was worked by hand eradication methods in 1949. On this area, it was noted that where heavy ribes populations occurred and a heavy dosage of spray solution had been applied, few bushes survived. Where bushes were scattered, an insufficient amount of solution had been used and ribes still remained. More thorough training in application of spray to individual bushes can eliminate this problem in the future.

Camp 152, Orofino Creek. In the Orofino Creek drainage, work was performed on 1945-1949 cutover areas and in 40- to 60-year-old pole stands. White pine is becoming established in the cutover portion. Broadcast power spraying with 2,4,5-T along roads and skid trails, where heavy concentrations of ribes occurred, greatly facilitated the working of this area.

Camp 153, Three Bear. Working was principally in 40- to 60-year-old stands in Tamarack Creek and Sylvan Creek. Working conditions varied greatly in the area and considerable difficulty was encountered in the brushy undercover. In the Tamarack area, the inaccessibility and steepness of the ground added to the cost of eradication.

Camp 154, Tamarack Ridge. Work was entirely in 40- to 60-year-old stands. A work road was constructed last year which made possible the establishment of a camp in this area. Working conditions were heavier than would normally be expected in this type of stand due to heavy alder glades at the head of practically all draws and the persistence of low brush which increased searching time. The stand is reaching the age where the canopy is rapidly closing and no further work should be necessary to protect the area. Considerable damage is occurring in this and the Camp 153 area from bears stripping the bark from the base of the trees in early spring. One attack is seldom fatal, but successive attacks finally cause girdling of the tree. In some cases, this has caused such damage to stocking that ribes are occurring in the resulting openings.

In addition to hand eradication work, power spraying was done in Orofino Creek on 1945-49 cutover areas. Both the Friend and Hardie sprayers were used. Work was principally along logging roads, skidways, and in a few spots where excessive germination had occurred.

METHODS AND EQUIPMENT

A training school was held for Forest Service blister rust control supervisors early in May. Bureau supervisors were given individual training and instruction prior to assuming their positions. A training school was held for all checkers. All eradication men were given intensive training in ribes eradication techniques with the aid of charts. The revised training charts and manual were a distinct aid in illustrating the one-man dragline method.

The one-man ribes eradication method was used by all camps and the merits of the system were demonstrated in increased efficiency and lower costs per acre. Individual efficiency and production ratings were kept and workers were advised of their respective standings. This contributed much to increasing the output per man-day. The Forest Service camps used a complete revision of the forms for reporting field data and found them satisfactory.

The hormone spray 2,4,5-T was used exclusively in chemical spraying. Flowable type emulsive oil was used as a spreader and sticker. A solution of 2,4,5-T and red dye for later identification of treated crowns was used in decapitation work. Power equipment was used where possible; otherwise, Hi-Fog guns and knapsack sprayers were employed. Some experimentation was conducted with spray and whirl discs for broadcast spraying where penetration through low brush was needed. The most satisfactory combination was an ordinary Hudson nozzle assembly with a small hole bored in the center of the whirl disc. This provided a solid cone and gave about 6 feet penetration through rather dense, low brush. The conventional Hudson disc was used for selective spraying. The Buffalo turbine blower was used experimentally on roadside work in St. Louis Gulch. The following tabulation shows data for power spraying work:

| <u>Area</u> | <u>Eradication Type</u> | <u>Acres</u> | <u>Man-Days</u> | <u>Gallons Spray</u> |
|-----------------|-----------------------------|--------------|-----------------|--------------------------|
| Mutton Gulch | Cutover 1940-44 | 53 | 70 | 6,800 |
| Rhodes Creek | " " " | 13 | 23 | 2,900 |
| Orofino Creek | " 1945-49 | 210 | 168 | 7,535 |
| St. Louis Gulch | " 1940-44 | 10 | 3 | 187 |

CHECKING

A crew consisting of five men employed by the Bureau and six men employed by the Forest Service conducted regular checks on all areas worked in 1949. Forest Service checkers were under the supervision of a checker foreman employed by the Forest Service. Bureau checkers were under the supervision of the assistant operation supervisor who also assisted with the Forest Service checking work. All checkers had previous ribes eradication experience but only one man had previous checking experience, necessitating intensive training and close supervision throughout the season.

A uniform system of checking areas worked by the one-man dragline method was adopted this year. Checkers progressed through the $2\frac{1}{2}$ -chain wide lanes on a diagonal course between the boundaries of the lane, completing four of these courses in each 4-chain lane, or each acre of ground. This system was modified on initial work where ribes were numerous or seedlings present by reducing the diagonal courses to two for each 4 chains of lane.

In addition to the regular check, advance checks were made on areas to be worked in 1949 where information was necessary on ribes distribution. Checks were also made on areas to be worked in 1950. Checkers laid all lines for eradication work.

WHITE PINE STOCKING AND DISEASE SURVEY

The white pine stocking and blister rust damage survey was continued on Clearwater National Forest lands during 1949 and initiated on lands of the Timber Protective Association. The Forest Service party was composed of two 2-man crews supervised by the checker foreman. The Bureau party consisted of two 2-man crews and a party leader. The survey was under the general supervision of the assistant operation supervisor. The survey was performed primarily in pole and reproduction stands, although on Association lands it was extended to cutover areas which had been logged for at least 15 years.

Surveys were made in the following working units:

| <u>National Forest Units</u> | <u>Unit Number</u> |
|------------------------------|--------------------|
| Gold Creek | 10 |
| Upper French Creek | 17 |
| Sylvan Creek | 18 |
| Tamarack Creek | 19 |
| Dan Lee and Swede Creeks | 55 |
| Orofino Creek | 56 |

| <u>Clearwater Timber Protective Association Units</u> | <u>Unit Number</u> |
|---|--------------------|
| Mosquito Creek | 1 |
| Brown's Creek | 3 |
| Orofino Creek | 6 |
| Jaype | 11 |
| Three Mile Creek | 12 |

Clearwater Timber Protective Association Units (contd.)Unit Number

| | |
|-----------------|----|
| Shanghai Creek | 13 |
| Orogrande Creek | 14 |
| Cardiff | 15 |
| Calhoun Creek | 17 |
| Deer Creek | 18 |
| Scofield Creek | 24 |

One hundred and one miles of strip were run on Association lands which represented a sample of approximately 16,000 acres of pole, reproduction, and cutover stands.

Definite conclusions cannot be reached on results of the survey until all data have been summarized. The survey shows that in all young stands of white pine blister rust will cause losses in stocking. The losses vary with the number of years between the time the disease entered the stand and the time control was established. In many pole and reproduction stands, the disease entered prior to initiation of control measures.

A measure of site quality was taken on all survey strips in addition to the data on stocking and blister rust losses. This information shows that a high site quality predominates throughout the Clearwater pine-growing region.

CONTROL STATUS

Blister rust infection occurs generally throughout the control area. On lands of the Clearwater Timber Protective Association it has been necessary, because of the small program of recent years, to confine efforts to the Pierce, Hollywood, and Headquarters blocks. The white pine stocking, cost of protection, diversity of age classes, and accessibility of areas give these blocks highest priority. The present program barely provides for adequate work in these blocks. Consequently, large drainages which have been recently logged and the majority of those to be cut in the near future cannot be given any blister rust protection under the present program. In the older cuttings and where work was kept on a better schedule, satisfactory progress has been made and infection is light enough to assure very good white pine stands at maturity. Recently, additional problems have been created in some older cuttings. On areas near BRC headquarters and on Rhodes Creek, contract loggers have removed small patches of mature timber adjacent to protected cutover and pole stands. In the process of logging, there was much ground disturbance in these protected areas and as a result additional ribes eradication work will be necessary. Better coordination in timing the cuttings on these areas would materially reduce the cost of blister rust protection. Practically the entire acreage worked on Timber Protective Association lands was on cutover areas too recently disturbed to classify as maintenance. Most of the mature stands being cut were considered as on maintenance but the lands now revert to the unworked category. Land is being removed from the maintenance class faster than it is being added.

The situation is more favorable on lands of the Clearwater National Forest. From the working unit analysis, a work plan has been developed for the forest. The work plan contemplates proper timing of work on cutover areas, plantations, and areas of natural reproduction and pole stands which are considered for protection. The size of recent programs has been adequate. Cutting practices are established with a view to limiting ribes regeneration. Over 70 percent of the area worked by Forest Service crews this season was in pole type and a large portion of this is now on a maintenance basis. There is a total of 87,912 acres on maintenance on the entire Clearwater operation. As a result of the 1949 eradication and checking work, 2,890 acres were placed on a maintenance basis and 1,757 acres were removed from this classification because of logging operations and surveys.

STATEMENT OF EXPENDITURES AND COSTS

The following table shows the statement of expenditures.

TABLE 1

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1949 CLEARWATER OPERATION

| Item | Bureau of Entomology & Plant Quarantine | | | | | Forest Service BLR-4 | Total |
|----------------------|---|---------------------|-------------------------|----------|----------|-------------------------|-----------|
| | BLR-1-4 | Cooperative Control | | | Total | | |
| | | BLR-3-4 | Federal State & Private | Total | | | |
| Contract ribes erad. | | \$ 470 | | \$ 470 | \$ 470 | | \$ 470 |
| Salary perm. men | \$11,376 | 1,133 | \$ 2,165 | 3,298 | 14,674 | \$ 7,800 | 22,474 |
| Salary temp. men | | 8,811 | 11,931 | 20,742 | 20,742 | 19,591 | 40,333 |
| Wages temp. labs. | 150 | 23,832 | | 23,832 | 23,982 | 98,019 | 122,001 |
| Subsistence supplies | | 6,181 | | 6,181 | 6,181 | 25,103 | 31,284 |
| Equipment | 248 | 49 | | 49 | 297 | 2,579 | 2,876 |
| Travel and transp. | 905 | 454 | | 454 | 1,359 | 9,562 | 10,921 |
| Other expenses | 1,487 | 2,092 | | 2,092 | 3,579 | 12,533 | 16,112 |
| Total | \$14,166 | \$43,022 | \$14,096 | \$57,118 | \$71,284 | \$175,187 | \$246,471 |

TABLE 2

SUMMARY OF RIBES ERADICATION, 1949
CLEARWATER OPERATION

| Working | Eradication Type | Year of Origin | Acres | Man-Days | Ribes | Per Acre | |
|-------------|------------------|----------------|--------|----------|---------|----------|-------|
| | | | | | | Man-Days | Ribes |
| First | Plantation | 1945-49 | 81 | 53 | 719 | .65 | 9 |
| | Cutover (3) | 1945-49 | 1,487 | 1,035 | 195,380 | .70 | 131 |
| | Cutover | 1940-44 | 520 | 381 | 32,225 | .73 | 62 |
| | Cutover | 1920-39 | 32 | 75 | 7,030 | 2.34 | 220 |
| | Pole | | 418 | 104 | 4,023 | .25 | 10 |
| | Mature | | 5 | 4 | 68 | .80 | 14 |
| | Stream (1) | | 120 | 28 | 2,834 | .23 | 24 |
| | Total | | 2,663 | 1,680 | 242,279 | .63 | 91 |
| Second | Cutover | 1945-49 | 174 | 270 | 27,780 | 1.55 | 160 |
| | Cutover (4) | 1940-44 | 964 | 1,717 | 117,187 | 1.78 | 122 |
| | Cutover | 1920-39 | 86 | 47 | 3,873 | .55 | 45 |
| | Reproduction | 1910-39 | 39 | 98 | 2,321 | 2.51 | 60 |
| | Pole | | 2,061 | 1,222 | 36,947 | .59 | 18 |
| | Total | | 3,324 | 3,354 | 188,108 | 1.01 | 57 |
| Third | Plantation | 1945-49 | 64 | 20 | 1,149 | .31 | 18 |
| | Cutover | 1940-44 | 148 | 95 | 6,238 | .64 | 42 |
| | Cutover | 1920-39 | 768 | 338 | 14,671 | .44 | 19 |
| | Reproduction | 1910-39 | 336 | 171 | 2,277 | .51 | 7 |
| | Pole | | 4,685 | 2,649 | 48,163 | .57 | 10 |
| | Mature | | 542 | 41 | 768 | .08 | 1 |
| | Stream (2) | | 114 | 38 | 2,114 | .33 | 19 |
| | Total | | 6,657 | 3,352 | 75,380 | .50 | 11 |
| GRAND TOTAL | | | 12,644 | 8,386 | 505,767 | .66 | 40 |

Chemical work included above:

| Stream | | | | Upland | | | |
|--------|-------|----------|---------------|--------|-------|----------|---------------|
| | Acres | Man-Days | Gallons Spray | | Acres | Man-Days | Gallons Spray |
| (1) | 50 | 9 | 45 | (3) | 210 | 168 | 7,535 |
| (2) | 114 | 38 | 186 | (4) | 68 | 95 | 9,787 |

TABLE 3

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1949
CLEARWATER OPERATION

| State | Working | Class | Acres | Man-Days | Ribes | Gallons Spray | Per Acre | |
|-------|--------------|----------|--------|----------|---------|---------------|----------|-------|
| | | | | | | | Man-Days | Ribes |
| Idaho | First | EQ-Coop. | 693 | 492 | 42,046 | 45 | .71 | 61 |
| | | FS-Reg. | 1,970 | 1,188 | 200,233 | 7,535 | .60 | 102 |
| | | Total | 2,663 | 1,680 | 242,279 | 7,580 | .63 | 91 |
| | Second | EQ-Coop. | 1,010 | 1,696 | 118,286 | 9,787 | 1.68 | 117 |
| | | EQ-Cont. | 40 | 68 | 2,774 | | 1.70 | 69 |
| | | FS-Reg. | 2,274 | 1,590 | 67,048 | | .70 | 29 |
| | | Total | 3,324 | 3,354 | 188,108 | 9,787 | 1.01 | 57 |
| | Third | EQ-Coop. | 1,063 | 483 | 23,840 | 186 | .45 | 22 |
| | | FS-Reg. | 5,594 | 2,869 | 51,540 | | .51 | 9 |
| | | Total | 6,657 | 3,352 | 75,380 | 186 | .50 | 11 |
| | All Workings | EQ-Coop. | 2,766 | 2,671 | 184,172 | 10,018 | .97 | 67 |
| | | EQ-Cont. | 40 | 68 | 2,774 | | 1.70 | 69 |
| | | FS-Reg. | 9,838 | 5,647 | 318,821 | 7,535 | .57 | 32 |
| | | Total | 12,644 | 8,386 | 505,767 | 17,553 | .66 | 40 |

TABLE 4

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1949
CLEARWATER OPERATION

| State | Working | Acres Worked | | | | | | | | | | | | |
|-------|---------|-------------------|-------|---------|-------|--|-------|---------|-------|-----------------|-------------|---------|-------|-------------|
| | | By Forest Service | | | | By Bureau of Entomology and Plant Quarantine | | | | Total Federal | Total Other | | | GRAND TOTAL |
| | | National Forest | State | Private | Total | National Forest | State | Private | Total | National Forest | State | Private | Total | |
| Idaho | First | 1,598 | | 372 | 1,970 | 33 | 248 | 412 | 693 | 1,631 | 248 | 784 | 1,032 | 2,663 |
| | Second | 2,030 | 134 | 110 | 2,274 | | 310 | 740 | 1,050 | 2,030 | 444 | 850 | 1,294 | 3,324 |
| | Third | 5,047 | 422 | 125 | 5,594 | | | 1,063 | 1,063 | 5,047 | 422 | 1,188 | 1,610 | 6,657 |
| | Total | 8,675 | 556 | 607 | 9,838 | 33 | 558 | 2,215 | 2,806 | 8,708 | 1,114 | 2,822 | 3,936 | 12,644 |

TABLE 5

RIBES SPECIES ERADICATED, 1949
CLEARWATER OPERATION

| Working | Eradication Type | Acres | Ribes Species | | | Total Ribes |
|-----------------|------------------------|--------|-------------------|------------------------|--------------------|----------------|
| | | | Ribes lacustre | Ribes viscosissimum | Ribes petiolare | |
| First | Plantation (1945-49) | 81 | 447 | 133 | 139 | 719 |
| | Cutover (1945-49) | 1,487 | 26,282 | 153,451 | 15,647 | 195,380 |
| | Cutover (1940-44) | 520 | 7,539 | 24,605 | 81 | 32,225 |
| | Cutover (1920-39) | 32 | 3,896 | 3,078 | 56 | 7,030 |
| | Pole | 418 | 2,198 | 1,264 | 561 | 4,023 |
| | Mature | 5 | 50 | | 18 | 68 |
| | Stream | 120 | 1,447 | 117 | 1,270 | 2,834 |
| | Total | 2,663 | 41,859 | 182,648 | 17,772 | 242,279 |
| Second | Cutover (1945-49) | 174 | 832 | 26,669 | 279 | 27,780 |
| | Cutover (1940-44) | 964 | 21,553 | 94,889 | 745 | 117,187 |
| | Cutover (1920-39) | 86 | 3,671 | 157 | 45 | 3,873 |
| | Reproduction (1910-39) | 39 | 6 | 2,315 | | 2,321 |
| | Pole | 2,061 | 22,525 | 14,001 | 421 | 36,947 |
| | Total | 3,324 | 48,587 | 138,031 | 1,490 | 188,108 |
| Third | Plantation (1945-49) | 64 | | 1,149 | | 1,149 |
| | Cutover (1940-44) | 148 | 1,729 | 4,440 | 69 | 6,238 |
| | Cutover (1920-39) | 768 | 2,737 | 11,673 | 261 | 14,671 |
| | Reproduction (1910-39) | 336 | 1,098 | 1,139 | 40 | 2,277 |
| | Pole | 4,685 | 21,481 | 26,336 | 346 | 48,163 |
| | Mature | 542 | 383 | 248 | 137 | 768 |
| | Stream | 114 | 1,048 | 169 | 897 | 2,114 |
| | Total | 6,657 | 28,476 | 45,154 | 1,750 | 75,380 |
| All Workings | Plantation (1945-49) | 145 | 447 | 1,282 | 139 | 1,868 |
| | Cutover (1945-49) | 1,661 | 27,114 | 180,120 | 15,926 | 223,160 |
| | Cutover (1940-44) | 1,632 | 30,821 | 123,934 | 895 | 155,650 |
| | Cutover (1920-39) | 886 | 10,304 | 14,908 | 362 | 25,574 |
| | Reproduction (1910-39) | 375 | 1,104 | 3,454 | 40 | 4,598 |
| | Pole | 7,164 | 46,204 | 41,601 | 1,328 | 89,133 |
| | Mature | 547 | 433 | 248 | 155 | 836 |
| | Stream | 234 | 2,495 | 286 | 2,167 | 4,948 |
| | Total | 12,644 | 118,922 | 365,833 | 21,012 | 505,767 |

TABLE 6

SUMMARY OF RIBES ERADICATION, 1929-1949
CLEARWATER OPERATION

| Working | Eradication Type | Year of Origin | Gross Acres Worked | Man-Days | Ribes | Per Acre | | Net Acreage Remaining | |
|---------|------------------|----------------|--------------------|----------|-------------|----------|-------|-----------------------|----------|
| | | | | | | Man-Days | Ribes | Worked | Unworked |
| First | Plantation | 1945-49 | 282 | 541 | 29,026 | 1.92 | 103 | 282 | |
| | Cutover (4) | 1945-49 | 1,619 | 1,063 | 198,157 | .66 | 122 | 1,619 | 14,117 |
| | Plantation | 1940-44 | 60 | 232 | 134,749 | 3.87 | 2,246 | 60 | |
| | Cutover (5) | 1940-44 | 9,657 | 12,465 | 5,335,821 | 1.29 | 553 | 9,657 | 25,552 |
| | Cutover | 1920-39 | 39,145 | 40,297 | 13,660,654 | 1.03 | 349 | 35,322 | 29,858 |
| | Reproduction | 1910-39 | 71,993 | 109,096 | 33,469,252 | 1.52 | 465 | 70,780 | 3,584 |
| | Pole | | 31,494 | 18,418 | 3,878,037 | .58 | 123 | 29,849 | 4,762 |
| | Mature | | 219,294 | 99,884 | 23,422,422 | .46 | 107 | 153,922 | 39,373 |
| | Miscellaneous | | 5,852 | 3,900 | 1,700,804 | .67 | 291 | 5,416 | 7,819 |
| | Stream (1) | | 42,536 | 78,391 | 14,098,578 | 1.84 | 331 | 42,536 | 13,492 |
| | Total | | 421,932 | 364,287 | 95,927,500 | .86 | 227 | 349,443 | 138,557 |
| Second | Plantation | 1945-49 | 201 | 287 | 20,183 | 1.43 | 100 | 201 | |
| | Cutover | 1945-49 | 174 | 270 | 27,780 | 1.55 | 160 | 174 | |
| | Plantation | 1940-44 | 60 | 194 | 15,587 | 3.23 | 260 | 60 | |
| | Cutover (6) | 1940-44 | 1,688 | 2,980 | 320,947 | 1.77 | 190 | 1,688 | |
| | Cutover | 1920-39 | 31,264 | 30,311 | 8,256,605 | .97 | 264 | 31,264 | |
| | Reproduction | 1910-39 | 26,875 | 42,095 | 3,791,630 | 1.57 | 141 | 26,799 | |
| | Pole | | 21,086 | 11,292 | 1,247,600 | .54 | 59 | 20,447 | |
| | Mature | | 16,333 | 7,983 | 815,665 | .49 | 50 | 14,173 | |
| | Miscellaneous | | 511 | 573 | 371,107 | 1.12 | 726 | 511 | |
| | Stream (2) | | 23,815 | 27,080 | 3,333,043 | 1.14 | 140 | 23,815 | |
| | Total | | 122,007 | 123,065 | 18,200,147 | 1.01 | 149 | 119,132 | |
| Third | Plantation | 1945-49 | 64 | 20 | 1,149 | .31 | 18 | 64 | |
| | Plantation | 1940-44 | 120 | 122 | 2,762 | 1.02 | 23 | 120 | |
| | Cutover | 1940-44 | 148 | 95 | 6,238 | .64 | 42 | 148 | |
| | Cutover | 1920-39 | 16,563 | 15,733 | 1,142,880 | .95 | 69 | 16,563 | |
| | Reproduction | 1910-39 | 8,317 | 10,813 | 475,959 | 1.30 | 57 | 8,317 | |
| | Pole | | 7,851 | 4,383 | 96,982 | .56 | 12 | 7,851 | |
| | Mature | | 542 | 41 | 768 | .08 | 1 | 542 | |
| | Stream (3) | | 3,548 | 4,071 | 412,204 | 1.15 | 116 | 3,548 | |
| | Total | | 37,153 | 35,278 | 2,138,942 | .95 | 58 | 37,153 | |
| | GRAND TOTAL | | 581,092 | 522,630 | 116,266,589 | .90 | 200 | 505,728 | |

Chemical work included above:

| Stream | | | | Upland | | | |
|------------|----------|---------------|--|---------|----------|---------------|--|
| Acres | Man-Days | Gallons Spray | | Acres | Man-Days | Gallons Spray | |
| (1) 15,140 | 31,439 | 811,448 | | (4) 210 | 168 | 7,535 | |
| (2) 5,910 | 8,256 | 120,043 | | (5) 335 | 371 | 23,221 | |
| (3) 924 | 1,556 | 25,467 | | (6) 68 | 95 | 9,787 | |

TABLE 7

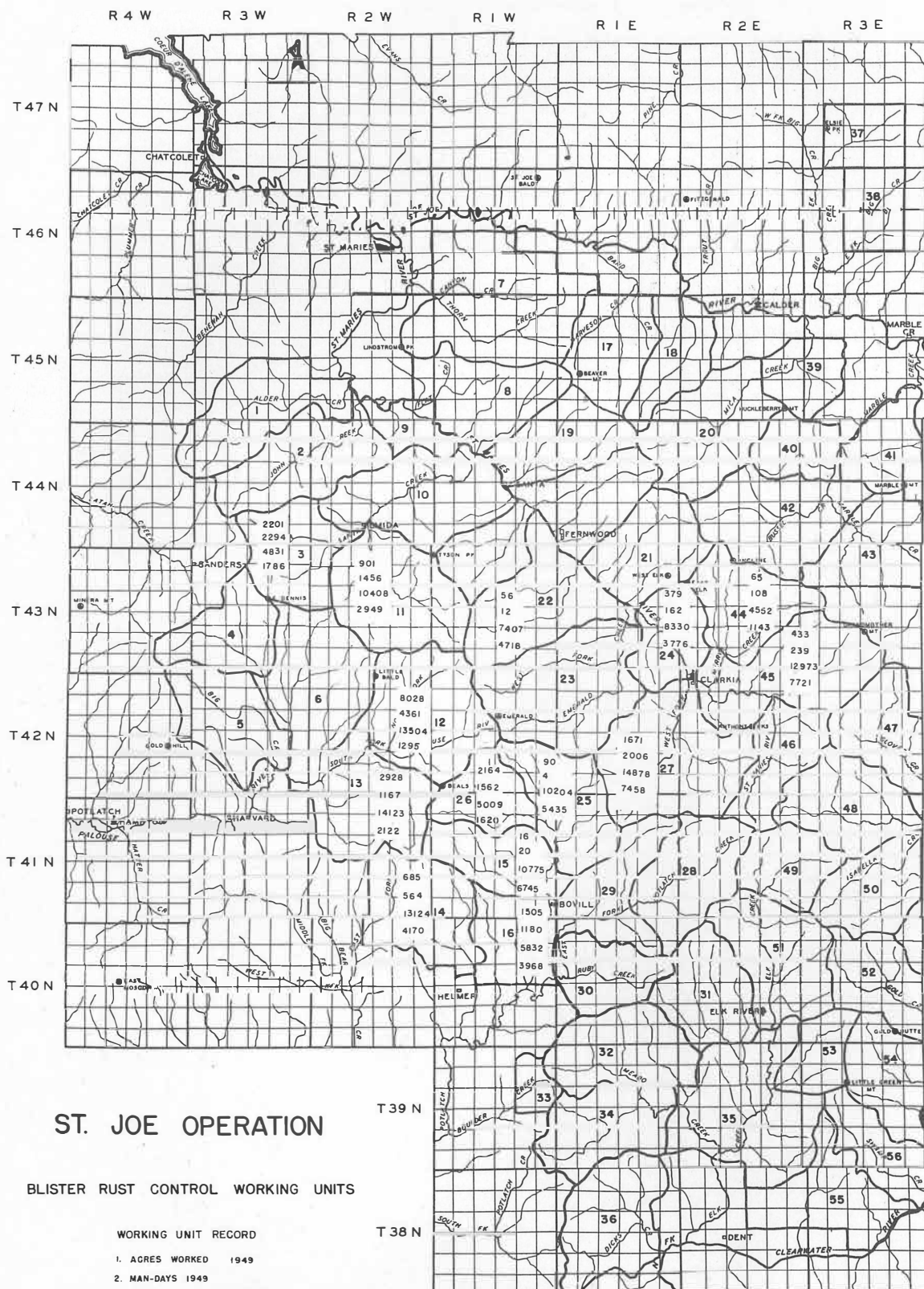
SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1929-1949
CLEARWATER OPERATION

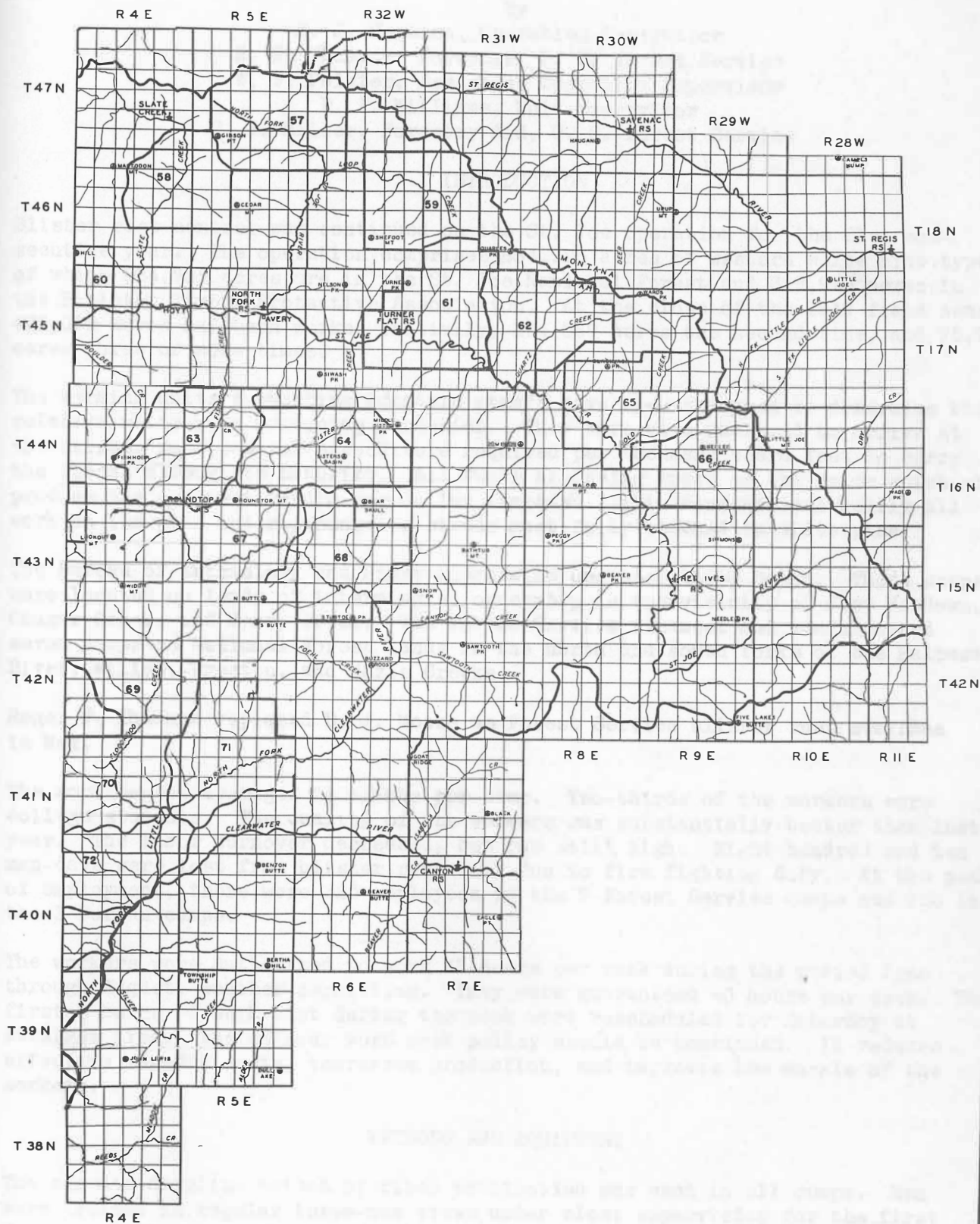
| State | Class | Gross Acres | Man-Days | Total Ribes | Gallons Spray | Per Acre | |
|-------|-----------|-------------|----------|-------------|---------------|----------|-------|
| | | | | | | Man-Days | Ribes |
| Idaho | EQ-Reg. | 4,412 | 5,273 | 1,129,228 | 79,864 | 1.20 | 256 |
| | EQ-Coop. | 61,573 | 57,385 | 7,851,066 | 168,800 | .93 | 128 |
| | EQ-Emerg. | 133,970 | 125,277 | 30,398,093 | 136,847 | .94 | 227 |
| | EQ-Cont. | 40 | 68 | 2,774 | | 1.70 | 69 |
| | FS-Reg. | 137,707 | 123,377 | 29,748,763 | 179,378 | .90 | 216 |
| | FS-Emerg. | 55,908 | 45,382 | 14,895,022 | 24,015 | .81 | 266 |
| | CCC | 187,482 | 165,868 | 32,241,643 | 408,597 | .88 | 172 |
| | Total | 581,092 | 522,630 | 116,266,589 | 997,501 | .90 | 200 |

TABLE 8

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1929-1949
CLEARWATER OPERATION

| State | Ownership | Net Acres in Control Area | | | | | |
|-------|------------------|---------------------------|---------|--------|---------|----------------|-------------|
| | | Acres Worked | | | | Acres Unworked | Total Acres |
| | | First | Second | Third | Total | | |
| Idaho | National Forest | 152,925 | 58,808 | 16,941 | 228,674 | 47,427 | 200,352 |
| | Public Domain | 3,648 | 708 | 52 | 4,408 | 382 | 4,030 |
| | Subtotal Federal | 156,573 | 59,516 | 16,993 | 233,082 | 47,809 | 204,382 |
| | State | 58,322 | 14,949 | 2,741 | 76,012 | 31,936 | 90,258 |
| | Private | 134,548 | 44,667 | 17,419 | 196,634 | 58,812 | 193,360 |
| | Subtotal Other | 192,870 | 59,616 | 20,160 | 272,646 | 90,748 | 283,618 |
| | Total | 349,443 | 119,132 | 37,153 | 505,728 | 138,557 | 488,000 |





BLISTER RUST CONTROL, ST. JOE OPERATION, 1949

By

H. J. Hartman, Operation Supervisor

R. F. Tha anum, Forester, U. S. Forest Service

W. F. Painter, Assistant Operation Supervisor

D. F. Williams, Unit Supervisor

C. J. Miller, Forestry Aid, U. S. Forest Service

INTRODUCTION

Blister rust control was continued on the St. Joe operation for the 21st consecutive year. The operation comprises 884,925 acres of western white pine type, of which 504,985 acres are in the St. Joe National Forest and 379,940 acres in the Potlatch Timber Protective Association. At the close of the 1949 field season 477,069 acres had been worked initially, 174,069 acres the second time, and 75,751 acres three or more times.

The working units supporting immature stands have been analyzed to determine their relative white pine producing potential. They were also analyzed to arrive at the blister rust control expenditure required per thousand board feet to carry the stands through to maturity. All funds are being spent on the units which will produce the greatest return per dollar invested. This concentrates nearly all work on the pole and reproduction stands most fully stocked to white pine.

The Bureau of Entomology and Plant Quarantine operated three camps. These camps were located on lands of intermingled ownership in the vicinity of Shea Meadows, Cougar Creek, and Merry Creek. The Forest Service financed and administered seven camps on National Forest lands in the north and south forks of the Palouse River, Willow, Preston, and Mazie Creeks.

Roger F. Tha anum replaced D. J. Moore as Forest Service blister rust staffman in May.

The work season averaged $2\frac{1}{2}$ months per camp. Two-thirds of the workers were college students. The quality of the workers was substantially better than last year. The labor turnover decreased, but was still high. Eight hundred and ten man-days were lost from blister rust work due to fire fighting duty. At the peak of employment, there were 325 employees in the 7 Forest Service camps and 120 in the 3 Bureau camps.

The workers were authorized to work 48 hours per week during the period June through August, weather permitting. They were guaranteed 40 hours per week. The first 8 hours of work lost during the week were rescheduled for Saturday at straight time. The 48-hour work week policy should be continued. It reduces effective man-day costs, increases production, and improves the morale of the workers.

METHODS AND EQUIPMENT

The one-man dragline method of ribes eradication was used in all camps. Men were trained in regular three-man crews under close supervision for the first few days. They were then assigned individually to lanes with a straw boss for

each eight men. In nearly all cases, the lanes were worked uphill. The worker usually laid the draglines in advance of the actual working of the strip.

Some 223 acres of heavy concentrations of ribes on streams and recently logged areas were treated with 2,4,5-T. A Bean power sprayer, knapsack sprayers, and Hi-Fog guns were used to apply the chemical.

Ammonium sulfamate was used extensively by all camps for ribes decapitation work. Each worker carried a supply of chemical on his belt in a rubberized pouch. One ton of dry chemical was used in ribes decapitation work.

The Forest Service awarded 6 ribes eradication contracts totaling 240 acres. The average bid price was \$14.05 per acre. The contract areas represented average to very difficult working conditions and averaged 15 ribes and .96 man-day per acre. Contract work has a very definite place in the control program and will be expanded. It provides an effective method to accomplish more and better work at a minimum cost. Small isolated blocks may be worked without establishing a Government camp. Any type of area may be contracted except those best suited for large scale chemical eradication. Ribes eradication experience provides the bidder with the necessary background to properly evaluate the area on which he plans to bid. Contracts should be 30 to 40 acres in size to attract more bidders and to create competition among bidders. If a contractor does poorly financially on one contract, he may improve his position on the next one.

Areas totaling 1,105 acres have been surveyed for Forest Service contract work and are to be advertised early in 1950.

LOCATION AND DESCRIPTION OF AREAS

All control work was concentrated on the following high priority units:

Upper Santa and Ramskull Creek, Unit No. 3.

This unit contains 13,000 acres on which occurs 4,000 acres of excellent white pine pole, reproduction, and plantation in a solid block. The other 9,000 acres in the unit have been recently cutover or are poorly stocked to white pine. All control work on this unit has been directed toward the protection of the 4,000 acres of immature white pine. Most of this has been worked three times and 3,000 acres have been worked down to maintenance standards. The remaining 1,000 acres supports light ribes as a result of a light broadcast burn in 1936. The 1950 control plans include the working of 460 acres of this area by contract. The 1948 disease survey indicated that 19 percent of the Ramskull Creek plantation and 27 percent of the pole stand on Willow Creek were damaged by blister rust. In 1949 all rework was completed for the Willow Creek drainage and the protection zone was extended to the East Dennis lookout. This rework program was started in 1948. The crews of a Forest Service camp worked 2,200 acres which averaged 1.04 man-days and 24 ribes per acre.

Charlie Creek, Unit No. 11.

This unit contains 7,680 acres of pole, reproduction, and plantation. Most of this area has been worked twice and is practically free of ribes. In 1949 first working was performed in upper Preston Creek on an area supporting an open pole stand that had been disturbed by fire and logging. An abundance of



W-671

Snow damage in dense 41 to 60 year old white pine pole stand during winter of 1948-49. The opening of these stands and the resulting soil disturbance cause ribes germination.



W-680

Type of areas covered by Bureau crews in 1949. West fork of Potlatch Creek in foreground and Moose Creek in background. Area was clear-cut during 1910 to 1923. Much of the area double-burned. Last major burn in 1923.

ribes were removed to protect the pine in the immediate vicinity and to extend the protective zone of the unit. Forest Service crews worked 900 acres averaging 1.64 man-days and 166 ribes per acre.

In the fall of 1948, 280 acres of unworked brushland on Preston Knob were prepared for broadcast burning in order to eliminate an infection hazard to the Charlie Creek plantation. A satisfactory burn was accomplished in September 1949 on half the area, which portion will be planted in the near future. The unburned portion will be burned in 1950.

Upper Palouse River, Unit No. 12

There is a total of 19,666 acres in this unit, of which 8,740 acres are natural white pine pole 41-60 years of age. This unit supports one of the better blocks of white pine pole on the forest. The remaining 10,926 acres are in a deferred status, most of which is cutover. Previous snow damage to the stands, dredging, and logging caused a large portion of the area to be worked a third time in 1949. The 1949 work area was all placed on post check due to snow damage that occurred during the winter of 1948-49. The crews of the 3 Forest Service camps in this unit worked 8,028 acres which averaged .54 man-day and 17 ribes per acre. All control work on this unit was completed for the present.

Sand Creek, Unit No. 13

This unit contains 10,000 acres of pole 41 to 60 years of age. This excellent block of pole is a continuation of the stand occurring on the east fork of Meadow Creek and Upper Palouse River unit. The 1949 disease survey showed 13 percent of the pole stand damaged by blister rust. The 2,930 acres worked by Forest Service crews averaged .70 man-day and 8 ribes per acre. Extensive snow damage occurred on this unit during the winter of 1948-49. Two additional camp seasons will be required to complete the work on this unit. A portion of Little Sand Creek has been logged and left in a nonreproductive state. The ribes will have to be removed from the logged area in order to protect the remaining stand in this drainage.

Corral Creek, Unit No. 14

Practically all of this unit was selectively logged or clear-cut and broadcast burned in the early twenties. The present stand is a mixed age class. The clear-cut and broadcast burned areas now support a good stand of white pine reproduction with new white pine seedlings still filling in the openings. This area was initially worked in 1936. In 1949, 685 acres of the 6,400 acres in the unit were worked for the second time by the Bureau. The area worked averaged .82 man-day and 24 ribes per acre. No ribes seedlings were found on the area. The 1949 disease survey showed that 32 percent of the pine had been damaged by blister rust. Two camps will complete the work on this unit in 1950.

Hog Meadow, Unit No. 16

Most of this unit was clear-cut and broadcast burned in the early twenties. A good stand of white pine reproduction is present and white pine seedlings are still appearing in the openings. The 1,505 acres worked by Bureau crews in 1949 for the second time, were first worked in 1936. The area averaged .78 man-day and 11 ribes per acre. No ribes seedlings were found. The 1949 disease survey

shows that 25 percent of the stand was damaged by blister rust. One camp-month in 1950 will be required to finish the work on this unit.

Cougar Creek, Unit No. 26.

This unit contains approximately 4,200 acres of good white pine reproduction which regenerated on clear-cut lands broadcast burned in 1914 and again in 1923. White pine reproduction is still coming in. The upper limits of this unit are poorly stocked and support a very dense stand of brush which has never been worked. The better stocked portion of the unit was initially worked in 1934 and 1936. In 1949, 2,164 acres were worked for the second time by Bureau crews. The worked area averaged .73 man-day and 7 ribes per acre. No ribes seedlings were found on the area. Work on this unit has been completed for the present.

West Fork of St. Maries River, Unit No. 27

This unit contains 13,000 acres of white pine pole and reproduction. The well stocked reproduction stands regenerated on areas that were broadcast burned between 1912 and 1928 following logging. The unit is potentially the best white pine producing area on the operation. Three workings have placed most of the unit on maintenance. In 1949 the Forest Service worked 1,670 acres which averaged 1.20 man-days and 12 ribes per acre. Stream type, recently cutover areas, and small blocks of upland not on maintenance were reworked. The work on this unit was completed for the next three years.

CHECKING

The procedure for regular and post check as outlined in the 1949 checking manual was applied to all areas checked. A Forest Service checker foreman assisted in the training and direction of all checkers. There were 12 Forest Service and 2 Bureau checkers. Six new assignments were filled by men with several years' ribes eradication experience who showed aptitude and interest for the work.

Inspection of the 1949 season's work plus needed post check information accounted for a high percentage of each checker's time. An analysis of activities indicated 65 percent of the total time was given to regular check, 25 percent to post check, and 10 percent to other assignments.

A total of 36,930 acres was checked: 21,120 acres were the 1949 season's eradication work area, and 15,810 acres were post check and maintenance areas.

The cost for regular and post check was 40¢ per acre.

CONTROL STATUS

There are 161,300 acres of maintenance on the operation. This total includes 5,500 acres which were added as a result of the 1949 ribes eradication and post check. There were 1,200 acres of maintenance which reverted to a rework status due to logging in 1949. An additional 8,300 acres of maintenance in pole type were reclassified to a post check status due to soil disturbances resulting from snow damage and other natural causes. Inspections by a post check will be necessary to determine the seedling survival within these areas.

The logging of mature stands continues to add more cutover acreage each year. To date, no large scale program on any cutover area has been possible in view of available funds.

SURVEYS

The survey to determine blister rust damage and the stocking in pole and reproduction stands of western white pine was continued to gain additional data for unit analysis and area classification. Six two-man crews carried on the survey work throughout the 1949 field season. The project was financed from Forest Service funds and a forest officer was chief of party. The Bureau provided the technical supervision. The survey was extensive in order to obtain an over-all picture of the disease conditions. Reproduction stands were only examined when the extent of damage was not known and in units where the advisability of control work was questionable.

The 269 miles of strip were run at the rate of 46 chains per man-day. Areas in 39 of the 72 units on the operation were examined. An analysis of data revealed that most young, unprotected stands were nearly 100 percent damaged, as was the case in the Red Ives region and Crystal Creek.

A field examination was made in September 1949 of the 120-year-old white pine stand on Simmons Creek near the mouth of Dolly Creek. Numerous ribs of all local species were present. Indications are that some loss will take place in this unprotected stand within 12 years. Multiple branch cankers and several dead tops were observed.

Results of the 1949 disease survey are briefed in the following tabulation:

| Drainage | Percent Quadrats Damaged | Drainage | Percent Quadrats Damaged |
|-------------------------|--------------------------------|---------------------------|--------------------------------|
| Corral Creek | 32 | Cameron Creek | 40 |
| Hog Meadows Creek | 25 | Butterfield-Oviat Creek | 32 |
| Flewsie Creek | 50 | Round-Long Meadow Creek | 46 |
| John Creek | 20 | Shattuck-Squaw Creek | 48 |
| W. Fk. Merry Creek | 46 | Cloverleaf-Bull Run Creek | 52 |
| Hatten Creek Plantation | 6 | S. Fk. Palouse River | 25 |
| Bussel-Marble Creek | 52 | N. Fk. Palouse River | 29 |
| Renfro Creek | 50 | Fry Creek | 13 |
| Moose Creek | 20 | Big Sand Creek | 13 |
| Cougar Creek | 44 | W. Fk. Charlie Creek | 11 |

Pole Blight Areas

During the 1949 field season nearly all large stands of white pine pole on the operation were inspected to obtain additional blister rust control information. In the course of these surveys, no new pole blight areas were observed by blister rust control employees. An extensive aerial and ground survey made by the Division of Forest Pathology discovered pole blight on Dago and lower Mica Creek and along the St. Joe River near the mouth of Marble Creek. The west fork of

Emerald Creek pole blight area still represents the southern known limits of this disease. No pole blight has been discovered on lands of the Potlatch Timber Protective Association.

Snow and Frost Damage.

The winter of 1948-49 was one of the most severe ever recorded in north Idaho. Very heavy snowfall along with temperatures from 38 to 50 degrees below zero and other unusual weather factors caused widespread damage to the reproduction and pole stands on the operation. Frost damage was very heavy in reproduction stands. However, the damage was confined to the first 2 chains of reproduction occurring along the edges of streams and meadows. A large portion of the damaged trees will recover while others are dead or will be badly deformed.

Snow damage in the dense 41- to 60-year-old pole stands was the most destructive and extensive on record. The damage, with little regard for species or exposure, was general throughout most dense pole stands. The opening of these stands and the resulting soil disturbance will cause ribes germination. Additional ribes eradication will be required on these areas. This damage occurred most extensively in the Palouse and St. Maries River drainages.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures is shown in the following table:

TABLE 1

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1949 ST. JOE OPERATION

| Item | Bureau of Entomology & Plant Quarantine | | | | | Forest Service BLR-4 | Total |
|----------------------|---|---------------------|--------------------|----------|----------|-------------------------|-----------|
| | BLR-1-4 | Cooperative Control | | | Total | | |
| | | Federal BLR-3-4 | State & Private | Total | | | |
| Contract ribes erad. | | | | | | \$ 4,434 | \$ 4,434 |
| Salary perm. men | \$15,883 | \$ 2,538 | | \$ 2,538 | \$18,421 | 10,639 | 29,060 |
| Salary temp. men | | 7,795 | \$ 903 | 8,698 | 8,698 | 21,773 | 30,471 |
| Wages temp. laborers | 150 | 27,411 | 10,799 | 38,210 | 38,360 | 159,702 | 198,062 |
| Subsistence supplies | 2,840 | 4,813 | | 4,813 | 7,653 | 37,349 | 45,002 |
| Equipment | 231 | 49 | | 49 | 280 | 8,500 | 8,780 |
| Travel and transp. | 1,465 | 710 | | 710 | 2,175 | 5,351 | 7,526 |
| Other expenses | 2,115 | 1,157 | | 1,157 | 3,272 | 13,436 | 16,708 |
| Total | \$22,684 | \$44,473 | \$11,702 | \$56,175 | \$78,859 | \$261,184 | \$340,043 |

TABLE 2

SUMMARY OF RIBES ERADICATION, 1949
ST. JOE OPERATION

| Working | Eradication Type | Year of Origin | Acres | Man-Days | Ribes | Per Acre | |
|-------------|------------------|----------------|--------|----------|---------|----------|-------|
| | | | | | | Man-Days | Ribes |
| First | Cutover (3) | 1940-44 | 416 | 477 | 76,985 | 1.15 | 185 |
| | Reproduction | 1910-39 | 176 | 255 | 34,666 | 1.45 | 197 |
| | Pole | | 684 | 1,300 | 99,692 | 1.90 | 146 |
| | Stream (1) | | 235 | 314 | 40,195 | 1.34 | 171 |
| | Total | | 1,511 | 2,346 | 251,538 | 1.55 | 166 |
| Second | Cutover | 1940-44 | 154 | 166 | 5,940 | 1.08 | 39 |
| | Reproduction | 1910-39 | 4,614 | 3,537 | 60,188 | .77 | 13 |
| | Pole | | 2,851 | 1,069 | 24,295 | .37 | 9 |
| | Stream | | 45 | 77 | 5,076 | 1.71 | 113 |
| | Total | | 7,664 | 4,849 | 95,499 | .63 | 12 |
| Third | Cutover | 1920-39 | 129 | 101 | 1,432 | .78 | 11 |
| | Reproduction | 1910-39 | 1,889 | 2,256 | 26,467 | 1.19 | 14 |
| | Pole | | 8,427 | 4,184 | 121,936 | .50 | 14 |
| | Mature | | 200 | 114 | 1,477 | .57 | 7 |
| | Stream (2) | | 1,302 | 1,305 | 48,488 | 1.00 | 37 |
| | Total | | 11,947 | 7,960 | 199,800 | .67 | 17 |
| GRAND TOTAL | | | 21,122 | 15,155 | 546,837 | .72 | 26 |

Chemical work included above:

| Stream | | | | Upland | | | |
|--------|-------|----------|------------------|--------|-------|----------|------------------|
| | Acres | Man-Days | Gallons Spray | | Acres | Man-Days | Gallons Spray |
| (1) | 113 | 137 | 2,939 | (3) | 96 | 60 | 5,289 |
| (2) | 14 | 9 | 46 | | | | |

TABLE 3

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1949
ST. JOE OPERATION

| State | Working | Class | Acres | Man-Days | Ribes | Gallons Spray | Per Acre | |
|-------|--------------|----------|--------|----------|---------|------------------|----------|-------|
| | | | | | | | Man-Days | Ribes |
| Idaho | First | FS-Reg. | 1,511 | 2,346 | 251,538 | 8,228 | 1.55 | 166 |
| | | EQ-Coop. | 4,150 | 3,137 | 46,743 | | .76 | 11 |
| | Second | FS-Reg. | 3,514 | 1,712 | 48,756 | | .49 | 14 |
| | | Total | 7,664 | 4,849 | 95,499 | | .63 | 12 |
| | | EQ-Coop. | 1,243 | 734 | 16,175 | 40 | .59 | 13 |
| | Third | FS-Reg. | 10,463 | 6,993 | 179,975 | 6 | .68 | 17 |
| | | FS-Cont. | 241 | 233 | 3,650 | | .97 | 15 |
| | | Total | 11,947 | 7,960 | 199,800 | 46 | .67 | 17 |
| | All Workings | EQ-Coop. | 5,393 | 3,871 | 62,918 | 40 | .72 | 12 |
| | | FS-Reg. | 15,488 | 11,051 | 480,269 | 8,234 | .71 | 31 |
| | | FS-Cont. | 241 | 233 | 3,650 | | .97 | 15 |
| | | Total | 21,122 | 15,155 | 546,837 | 8,274 | .72 | 26 |

TABLE 4

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1949
ST. JOE OPERATION

| State | Working | Acres Worked | | | | | | | | | | | | | | | | GRAND TOTAL |
|-------|---------|----------------------|------------------|-------|---------|--------|---|------------------|-------|---------|-------|--------------------|------------------|-------------|---------|-------|--------|----------------|
| | | By Forest Service | | | | | By Bureau of Entomology and Plant Quarantine | | | | | Total Federal | | Total Other | | | | |
| | | National Forest | Public Domain | State | Private | Total | National Forest | Public Domain | State | Private | Total | National Forest | Public Domain | State | Private | Total | | |
| Idaho | First | 1,041 | | | 470 | 1,511 | | | | | | 1,041 | | | 470 | 470 | 1,511 | |
| | Second | 1,891 | | 426 | 1,197 | 3,514 | 2,057 | | 1,439 | 654 | 4,150 | 3,948 | | 1,865 | 1,851 | 3,716 | 7,664 | |
| | Third | 6,989 | 214 | 54 | 3,447 | 10,704 | 219 | 3 | 110 | 911 | 1,243 | 7,208 | 217 | 164 | 4,358 | 4,522 | 11,947 | |
| | Total | 9,921 | 214 | 480 | 5,114 | 15,729 | 2,276 | 3 | 1,549 | 1,565 | 5,393 | 12,197 | 217 | 2,029 | 6,679 | 8,708 | 21,122 | |

TABLE 5

RIBES SPECIES ERADICATED, 1949
ST. JOE OPERATION

| Working | Eradication Type | Acres | Ribes Species | | | | Total Ribes |
|-----------------|------------------------|--------|-------------------|------------------------|--------------------|------------------|----------------|
| | | | Ribes lacustre | Ribes viscosissimum | Ribes petiolare | Ribes inermis | |
| First | Cutover (1940-44) | 416 | 66,531 | 10,454 | | | 76,985 |
| | Reproduction (1910-39) | 176 | 27,074 | 7,592 | | | 34,666 |
| | Pole | 684 | 96,279 | 3,413 | | | 99,692 |
| | Stream | 235 | 39,167 | 1,028 | | | 40,195 |
| | Total | 1,511 | 229,051 | 22,487 | | | 251,538 |
| Second | Cutover (1940-44) | 154 | 3,424 | 2,516 | | | 5,940 |
| | Reproduction (1910-39) | 4,614 | 22,361 | 37,806 | | 21 | 60,188 |
| | Pole | 2,851 | 14,914 | 9,381 | | | 24,295 |
| | Stream | 45 | 5,058 | 18 | | | 5,076 |
| | Total | 7,664 | 45,757 | 49,721 | | 21 | 95,499 |
| Third | Cutover (1920-39) | 129 | 245 | 1,187 | | | 1,432 |
| | Reproduction (1910-39) | 1,889 | 11,476 | 14,765 | 226 | | 26,467 |
| | Pole | 8,427 | 51,665 | 70,213 | 58 | | 121,936 |
| | Mature | 200 | 1,315 | 162 | | | 1,477 |
| | Stream | 1,302 | 41,978 | 602 | 5,219 | 689 | 48,488 |
| All Workings | Total | 11,947 | 106,679 | 86,929 | 5,503 | 689 | 199,800 |
| | Cutover (1940-44) | 570 | 69,955 | 12,970 | | | 82,925 |
| | Cutover (1920-39) | 129 | 245 | 1,187 | | | 1,432 |
| | Reproduction (1910-39) | 6,679 | 60,911 | 60,163 | 226 | 21 | 121,321 |
| | Pole | 11,962 | 162,858 | 83,007 | 58 | | 245,923 |
| All Workings | Mature | 200 | 1,315 | 162 | | | 1,477 |
| | Stream | 1,582 | 86,203 | 1,648 | 5,219 | 689 | 93,759 |
| | Total | 21,122 | 381,487 | 159,137 | 5,503 | 710 | 546,837 |

TABLE 6
SUMMARY OF RIBES ERADICATION 1929-1949
ST. JOE OPERATION

| Working | Eradication Type | Year of Origin | Gross Acres Worked | Man-Days | Ribes | Per Acre | | Net Acreage Remaining | |
|---------|------------------|----------------|--------------------|----------|-------------|----------|-------|-----------------------|----------|
| | | | | | | Man-Days | Ribes | Worked | Unworked |
| First | Cutover | 1945-49 | | | | | | | 9,282 |
| | Plantation | 1940-44 | 2,209 | 4,763 | 1,092,843 | 2.16 | 495 | 2,209 | |
| | Cutover | 1940-44 | 1,070 | 1,608 | 131,044 | 1.50 | 122 | 1,070 | 34,042 |
| | Cutover (4) | 1920-39 | 16,498 | 11,543 | 3,604,682 | .70 | 218 | 16,498 | 156,691 |
| | Reproduction | 1910-39 | 218,195 | 241,568 | 81,203,768 | 1.11 | 372 | 217,988 | 104,460 |
| | Pole | | 87,522 | 34,382 | 7,879,747 | .39 | 90 | 87,257 | 17,726 |
| | Mature | | 177,162 | 68,756 | 17,998,538 | .39 | 102 | 113,588 | 85,655 |
| | Miscellaneous | | 2,652 | 2,297 | 767,429 | .87 | 289 | 2,652 | |
| | Stream (1) | | 35,807 | 97,710 | 23,434,331 | 2.73 | 654 | 35,807 | |
| | Total | | 541,115 | 462,627 | 136,112,382 | .85 | 252 | 477,069 | 407,856 |
| Second | Plantation | 1940-44 | 1,198 | 1,207 | 57,827 | 1.01 | 48 | 1,198 | |
| | Cutover | 1940-44 | 154 | 166 | 5,940 | 1.08 | 39 | | 154 |
| | Cutover | 1920-39 | 7,684 | 8,519 | 549,431 | 1.11 | 72 | 7,684 | |
| | Reproduction (5) | 1910-39 | 90,973 | 106,496 | 9,512,700 | 1.17 | 105 | 90,973 | |
| | Pole | | 51,945 | 27,620 | 1,488,179 | .53 | 29 | 51,762 | |
| | Mature | | 9,478 | 7,254 | 837,751 | .77 | 89 | 8,568 | |
| | Miscellaneous | | 540 | 730 | 34,169 | 1.35 | 63 | | 540 |
| | Stream (2) | | 13,190 | 28,701 | 5,247,068 | 2.18 | 398 | 13,190 | |
| | Total | | 175,162 | 180,693 | 17,733,065 | 1.03 | 101 | 174,069 | |
| | Plantation | 1940-44 | 518 | 929 | 18,214 | 1.79 | 35 | | 518 |
| Third | Cutover | 1920-39 | 6,472 | 4,498 | 84,526 | .69 | 13 | 6,472 | |
| | Reproduction | 1910-39 | 35,497 | 55,341 | 1,093,249 | 1.56 | 31 | 35,497 | |
| | Pole | | 20,467 | 11,868 | 251,690 | .58 | 12 | 20,467 | |
| | Mature | | 370 | 439 | 39,519 | 1.19 | 107 | 370 | |
| | Miscellaneous | | 49 | 5 | | .10 | 1 | | 49 |
| | Stream (3) | | 12,378 | 18,995 | 1,902,527 | 1.53 | 154 | 12,378 | |
| | Total | | 75,751 | 92,075 | 3,389,729 | 1.22 | 45 | 75,751 | |
| | GRAND TOTAL | | 792,028 | 735,395 | 157,235,176 | .93 | 199 | 726,889 | |

Chemical work included above:

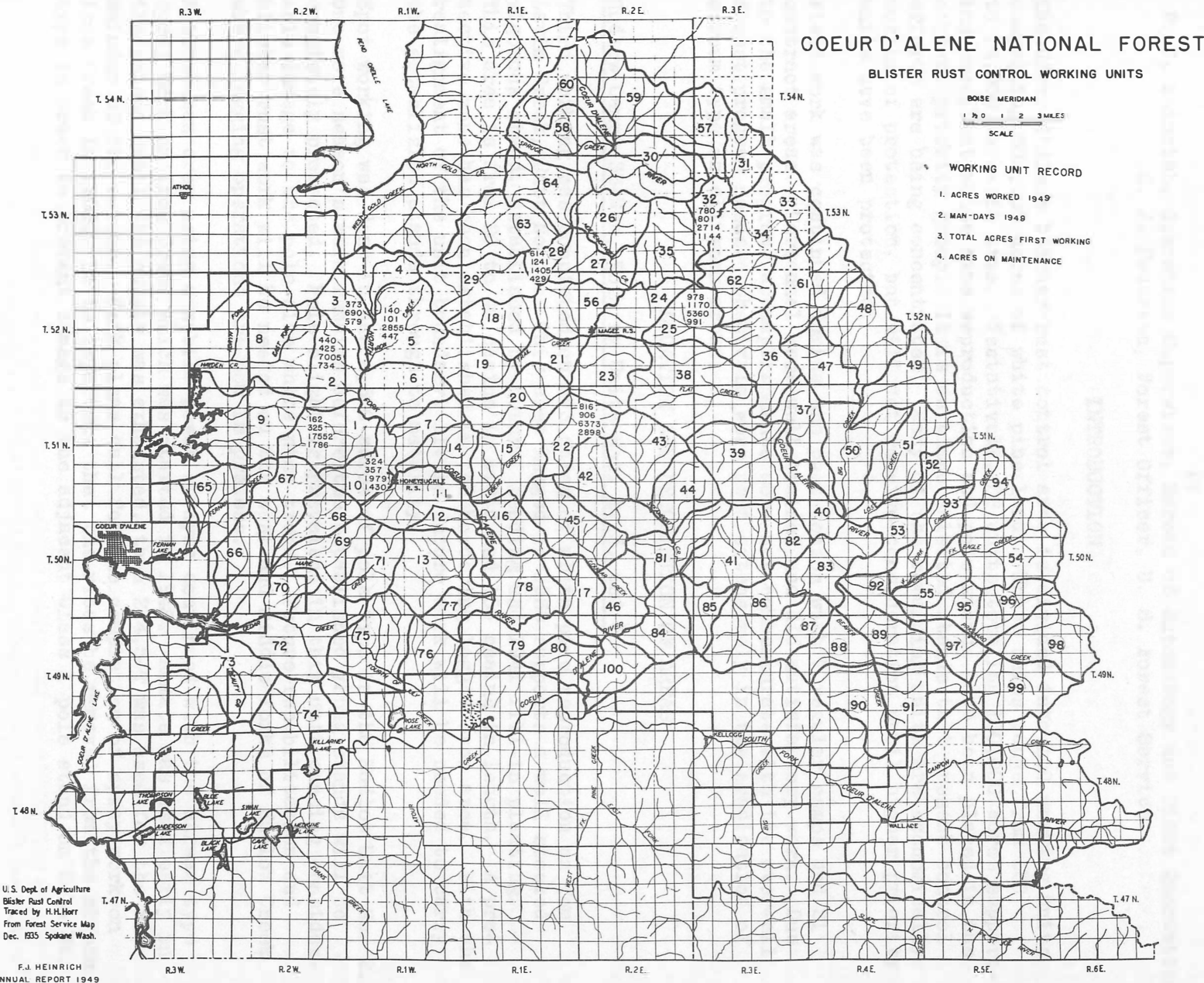
| Stream | | | Upland | | |
|-----------|----------|---------------|--------|----------|---------------|
| Acres | Man-Days | Gallons Spray | Acres | Man-Days | Gallons Spray |
| (1) 7,607 | 22,041 | 675,745 | (4) 96 | 60 | 5,289 |
| (2) 3,327 | 4,858 | 113,162 | (5) 21 | 78 | 137 |
| (3) 3,260 | 3,580 | 28,616 | | | |

TABLE 7
SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1929-1949
ST. JOE OPERATION

| State | Class | Gross Acres | Man-Days | Total Ribes | Gallons Spray | Per Acre Man-Days | Ribes |
|-------|-----------|-------------|----------|-------------|---------------|-------------------|-------|
| Idaho | EQ-Coop. | 65,768 | 55,308 | 5,337,354 | 65,121 | .84 | 81 |
| | EQ-Emerg. | 234,519 | 157,898 | 43,593,387 | 77,088 | .67 | 186 |
| | FS-Reg. | 228,262 | 251,462 | 36,076,686 | 330,558 | 1.10 | 158 |
| | FS-Cont. | 256 | 244 | 4,340 | | .95 | 17 |
| | FS-Emerg. | 70,981 | 45,138 | 15,333,106 | 101,476 | .64 | 216 |
| | CCC | 192,242 | 225,345 | 56,890,303 | 248,706 | 1.17 | 296 |
| | Total | 792,028 | 735,395 | 157,235,176 | 822,949 | .93 | 199 |

TABLE 8
OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1929-1949
ST. JOE OPERATION

| State | Ownership | Net Acres in Control Area | | | | | |
|-------|------------------|---------------------------|---------|--------|---------|----------------|-------------|
| | | Acres Worked | | | | Acres Unworked | Total Acres |
| | | First | Second | Third | Total | | |
| Idaho | National Forest | 216,790 | 95,562 | 42,543 | 354,895 | 96,911 | 313,701 |
| | Public Domain | 12,458 | 5,411 | 2,866 | 20,735 | 12,637 | 25,095 |
| | Subtotal Federal | 229,248 | 100,973 | 45,409 | 375,630 | 109,548 | 338,796 |
| | State | 56,371 | 23,674 | 6,961 | 87,006 | 58,898 | 115,269 |
| | Private | 191,450 | 49,422 | 23,381 | 264,253 | 239,410 | 430,860 |
| | Subtotal Other | 247,821 | 73,096 | 30,342 | 351,259 | 298,308 | 546,129 |
| | Total | 477,069 | 174,069 | 75,751 | 726,889 | 407,856 | 884,925 |



BLISTER RUST CONTROL, COEUR D'ALENE OPERATION, 1949

By

F. J. Heinrich, Operation Supervisor, Bureau of Entomology and Plant Quarantine
C. J. Pederson, Forest Officer, U. S. Forest Service

INTRODUCTION

The Coeur d'Alene blister rust control area is divided into 100 working units comprising 383,000 acres of white pine land. These units range from 650 to 14,000 acres in size. Tentatively, 22 units totaling 130,000 acres supporting excellent white pine reproduction and pole stands have been placed in the highest priority group. It is on these selected stands that present control efforts are being concentrated. Many of the remaining units are economically worthy of protection, but will not receive consideration until higher priority units have been protected.

Field work was continued during the past season with 7 regular camps and 21 contract areas. Personnel were well trained and did satisfactory work. Due to the small program, accomplishments were not commensurate with the over-all forest program needs. Chemicals were used extensively in the eradication of stream type on all work areas.

LOCATION AND DESCRIPTION OF AREAS

Hudlow Camp, 33-Man, Working Units Nos. 2, 3, and 5.

Third working was completed on 373 acres of white pine reproduction on Tom Lavin Creek, Unit No. 3. This area logged in 1935 supports a well stocked vigorous stand, established by natural seeding and 1941 fill-in planting. This area is from 20 to 40 chains in width and 150 chains in length. A protective zone has been established in the bordering logged over area. With the realignment of the unit boundary, little future work will be needed to carry the established stands through to maturity.

Spot working was done in the 2,600 acres of pole type in the Hudlow Unit No. 2. One more season's work remains before the established young stands will be completely protected. Pole blight is prevalent in this unit causing considerable damage to the pole size white pine trees. Future rehabilitation and blister rust work will be needed on the west and middle forks of Hudlow Creek where logging operations are now in process.

A three-man crew using a mobile power sprayer continued with the stream type spray work on Iron Creek which was started in 1948. Ammate was used early in the season until the supply was exhausted, then 2,4,5-T was used for the remainder of the season. Work plans call for the completion of spray work on Iron Creek in 1950. It is important that the ribes be removed from the stream type in order to prevent damage to the adjacent Class I pole stand on Colt Mt.

Lone Cabin Camp, 33-Man, Working Units Nos. 1 and 10.

Work was performed in Burnt Cabin and Lost Mine Creek drainages in Unit No. 1. This was a continuation of the work started in 1948 and completes the current work needed in these reproduction and pole stands.

Second working was completed on 210 acres and first working on 100 acres in the pole stand in upper Deception Creek, Unit 10. This unit not only consists of excellent pine stands, but is also the Deception Creek Experimental Forest which comprises 3,500 acres. One-third of this area is now on maintenance. Another season's work will be needed to bring the work in this unit up to schedule.

On portions of this area, there was considerable recent blowdown and snow damage to the pine. These areas should be inspected in 1951 to check on ribes regeneration.

Riley Creek Camp, 60-Man, Working Unit No. 22

Control work was continued on the 6,000-acre block of reproduction and pole stands in the Tepee Creek Unit. Although over 2,000 acres are classified as being on maintenance, ribes eradication work is far behind schedule. In 1948, second working was begun in this unit which received initial work in 1934. Blister rust has damaged 16 percent of the stand. Regardless of infection losses, the area still remains well stocked. Completion of the work planned during the next 2 years will give complete protection to the present established stands.

The 270-acre mature stand in the head of Riley Creek is in the process of being cut. Management plans call for silvicultural practices that will reduce to the fullest extent possible ribes potentials which might become a hazard to adjacent pole stands.

Nowhere Camp, 30-Man; Magee Camp, 10-Man; Working Unit No. 25

Work within this 5,000-acre unit is nearing completion. This area supports excellent young reproduction and extensive plantations of 1934 and 1941 origin. Apparently ribes germination has ceased on nearly all areas within this unit. Results of an intensive flanker check showed ribes on only a small portion of the 1941 plantation which was last worked in 1945.

Crewmen from the Nowhere Camp worked in President, Vice President, and Nowhere Creek drainages. The Magee camp worked only on chemical eradication. One hundred and eighty acres supporting heavy ribes population were sprayed with 2,4,5-T chemical solution. This area was located in the heads of Senator, New Deal, and Molly Creek drainages and presented a hazard to the extensive plantations in these drainages. Chemical was applied from Hi-Fog units, mobile power, and knapsack sprayers.

As a result of proper work scheduling and past efficient ribes eradication, blister rust damage to the pine is negligible.

Independence Creek Camp, 33-Man, Working Units Nos. 28 and 63

During the past season, an adjustment was made in these two working unit boundaries. Working Unit No. 28 now consists of a 2,000-acre block of white pine largely plantations of 1926, 1933, and 1941 origin. Fill-in planting has also been done in recent years. Field work this year was a continuation of that started in 1948. In addition to the 150 acres of upland worked, 73 acres of first working stream type were completed on Independence Creek. These heavy Ribes inerme and R. lacustre concentrations were treated with 2,4,5-T. All three types of chemical equipment were used.

Necessary work on this unit will be completed by ribes eradication contractors next year. Blister rust damage averages 10 percent.

Jordan Creek Camp, 33-Man, Working Unit No. 32

Rework was completed on 645 acres of 1924 Class I plantation and natural reproduction lying north and west of East Cathedral Lookout. Stream type along the Coeur d'Alene River comprising 60 acres was treated with 2,4,5-T.

Control work is nearing completion on this 2,700-acre unit which consists largely of plantations of 1923-24 origin. Future work will be needed on a 200-acre block located in the west portion of the unit where dense brush and numerous ribes have resulted in difficult working conditions.

This is an outstanding unit where very little blister rust damage has occurred.

WORKING METHODS

A training school for supervisory personnel was held at Hudlow during the first week in June. Complete instructions were given on all phases of ribes eradication work. All crewmen were given thorough training at their respective camps.

The one-man dragline method was used on all camps. Results obtained from the use of this method were highly satisfactory.

A change was made from the use of Ammate to 2,4,5-T in the treatment of stream type ribes. Ammate which was used in 1948 proved to be unsatisfactory. Some of the ribes which appeared to be dead in the fall of 1948 resprouted in the spring of 1949. It appears that 2,4,5-T will give excellent results on all upland and stream type ribes on the forest. However, final results will not be known until the spring of 1950.

CONTRACT WORK

The contract program for ribes eradication was started July 1 and by early August, 22 areas had been posted for bid. Bid prices in one case were rejected as being too high. This unit was readvertised and a more favorable price accepted. Another contract was canceled due to the contractor's inability to begin work by the stipulated deadline. Eighteen of the contracts were completed. Extension of time to June 30, 1950, was granted on three. Bid prices ranged from \$10.50 to \$22.90 per acre, the average being \$14.91. Administrative costs were \$2 per acre.

Contractors completed 962 acres in the 10- to 20-year age class. Twenty-eight ribs were removed per acre at .88 man-day. Workers were required to use the dragline method and reduce the ribs population to one or less per acre, with not more than 5 feet of live stem. The interest with which workers have accepted the contract idea indicates the possibility of a larger contract program in 1950.

CONTROL STATUS

At the close of the 1949 field season, 96,000 acres or 25 percent of the work area within the control boundary has been placed on maintenance. This protected area comprises 15,000 acres of reproduction, 29,000 acres of pole, and 52,000 acres of mature type. Approximately 50,000 acres have been brought to near maintenance standard needing only a small amount of rework before being adequately protected. The net increase in maintenance has been small during the past few years as area removed from maintenance due to cutting nearly offsets acreage gained in the protection of younger age class stands.

If present high priority units are to be carried through to maturity, an increased program is mandatory. The past season's work accomplishments were only 35 percent adequate. When the working units have been completely analyzed, it will be possible to show the amount of work done and the man-days remaining to give complete protection to each unit. It is planned to show this information in the 1950 annual report.

CHECKING AND SURVEYS

A training school for 10 checkers was held at Hudlow during the last week in June. All checking personnel were capable with nine having previous checking experience. On areas worked using the dragline method, all work lots were promptly checked. The checker ran an 8-foot wide meandering course between the boundaries of the $2\frac{1}{2}$ -chain wide lanes and each strip was tied in at 5-chain intervals. This checking method worked satisfactorily as the checker could concentrate on searching without the interference of pacing and compass work. When no regular check was needed, checking personnel laid crew lanes or ran post checks.

A post check was conducted on 9,172 acres of white pine reproduction and plantations. Information was obtained to show the effectiveness of past eradication work and to segregate areas upon which future work will be needed.

POST CHECK 1949

| Working Unit Number | Name | Drainage | Acres Checked |
|---------------------------|-----------------------------|------------------------------------|------------------|
| 27 | Owl and Independence Creeks | Lower Independence Creek | 3,132 |
| 22 | Riley Creek | Short Creek | 621 |
| 36 | Nowhere | Brett, Senator, and Nowhere Creeks | 2,951 |
| 10 | Deception | Coffee and Sands Creeks | 832 |
| 2 | Hudlow | East Fork Hudlow Creek | 53 |
| 2 | Hudlow | West Fork Hudlow Creek | 687 |
| 2 | Hudlow | Nicholas Creek | 896 |
| Total | | | 9,172 |

Pine disease and stocking surveys to determine the present blister rust damage and stocking by tree species were continued again this year. All high priority reproduction and pole areas have now been covered, some rather extensively. Next year additional strips will be run on doubtful areas and a few outlying unsurveyed areas included. This information is necessary in order to analyze the areas in each unit to determine potential pine values at maturity and priority of work areas.

During the past season, 12,273 chains of survey strips were run in the following drainages:

WHITE PINE DISEASE AND STOCKING SURVEYS, 1949

| Working Unit Number | Drainage | Chains Survey Strip |
|---------------------------|---|---------------------------|
| 1 | Burnt Cabin and Lost Mine Creeks | 220 |
| 3 | Tom Lavin, Lewelling, and Squirrel Creeks | 1,130 |
| 5 | Iron and Moose Creeks | 30 |
| 6 | Barney, Scribe, and Argument Creeks | 150 |
| 8 | Hayden and E. Fork Hayden Creeks | 310 |
| 10 | Deception and Coffee Creeks | 300 |
| 11 | Knight Creek | 100 |
| 12 | Coeur d'Alene River | 210 |
| 29 | Goose Creek | 140 |
| 31 | Alden, Cabin, Falls, and Jordan Creeks | 720 |
| 32 | Cathedral, Ethel, Tsuga Creeks, and Coeur d'Alene River | 940 |
| 34 | Lost Fork Jordan and Calamity Creeks | 1,500 |
| 35 | West Elk Creek | 90 |
| 51 | Lost Creek | 140 |
| 52 | East Fork Lost Creek | 210 |
| 56 | Bear, W. Fork Bear, and Evans Creeks | 315 |
| 57 | | |
| 59 | Buckskin Creek and Coeur d'Alene River | 450 |
| 63 | Declaration, Surprise, and Ermine Creeks | 1,630 |
| 67 | Stella Creek | 710 |
| 75 | Mill, Reserve, and Fourth of July Creeks | 370 |
| 77 | Gimlet Creek | 640 |
| 78 | Little Tepee Creek and Little No. Fk. Coeur d'Alene River | 310 |
| 86 | Graham, E. Fk. Graham, and Deceitful Creeks | 194 |
| 88 | White, Scott, Missouri, and Rock Creeks | 590 |
| 90 | Dudley and Ferguson Creeks | 340 |
| 91 | Pony and Unknown Creeks | 170 |
| 92 | Prichard Creek | 80 |
| 57 | Deer, Blacktail, and Whitetail Creeks | 248 |
| Total | | 12,237 |

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures is shown in the following table.

TABLE 1
CLASSIFIED EXPENDITURES, CALENDAR YEAR 1949
COEUR D'ALENE OPERATION

| Item | Bureau of Entomology and Plant Quarantine | Forest Service | Total |
|----------------------|--|----------------|-----------|
| | BLR-1-4 | BLR-4 | |
| Contract ribes erad. | | \$ 14,089 | \$ 14,089 |
| Salary perm. men | \$4,618 | 11,041 | 15,659 |
| Salary temp. men | | 13,996 | 13,996 |
| Wages temp. labs. | 60 | 88,463 | 88,523 |
| Subs. supplies | | 27,335 | 27,335 |
| Equipment | 92 | 6,071 | 6,163 |
| Travel and transp. | 318 | 8,404 | 8,722 |
| Other expenses | 449 | 7,967 | 8,416 |
| Total | \$5,537 | \$177,366 | \$182,903 |

TABLE 2

SUMMARY OF RIBES ERADICATION, 1949
COEUR D'ALENE OPERATION

| Working | Eradication Type | Year of Origin | Acres | Man-Days | Ribes | Per Acre | |
|-------------|------------------|----------------|-------|----------|---------|----------|-------|
| | | | | | | Man-Days | Ribes |
| First | Reproduction | 1910-39 | 50 | 76 | 1,017 | 1.52 | 20 |
| | Pole | | 100 | 97 | 2,729 | .97 | 27 |
| | Stream (1) | | 73 | 462 | 37,100 | 6.33 | 508 |
| | Total | | 223 | 635 | 40,846 | 2.85 | 183 |
| Second | Plantation | 1945-49 | 50 | 34 | 806 | .68 | 16 |
| | Plantation | 1940-44 | 364 | 310 | 20,011 | .85 | 55 |
| | Reproduction | 1910-39 | 492 | 936 | 71,509 | 1.90 | 145 |
| | Pole | | 992 | 1,055 | 22,759 | 1.06 | 23 |
| | Stream (2) | | 220 | 310 | 17,190 | 1.41 | 78 |
| | Total | | 2,118 | 2,645 | 132,275 | 1.25 | 62 |
| Third | Plantation | 1940-44 | 24 | 35 | 707 | 1.46 | 29 |
| | Cutover | 1920-39 | 130 | 289 | 7,924 | 2.22 | 61 |
| | Reproduction | 1910-39 | 1,925 | 2,139 | 30,124 | 1.11 | 16 |
| | Pole | | 75 | 33 | 538 | .44 | 7 |
| | Stream (3) | | 132 | 240 | 30,010 | 1.82 | 227 |
| | Total | | 2,286 | 2,736 | 69,303 | 1.20 | 30 |
| GRAND TOTAL | | | 4,627 | 6,016 | 242,424 | 1.30 | 52 |

Chemical work included above:

| | | | Gallons |
|-----|-------|----------|---------|
| | Acres | Man-Days | Spray |
| (1) | 73 | 462 | 3,710 |
| (2) | 220 | 310 | 2,929 |
| (3) | 132 | 240 | 2,961 |

TABLE 3

RIBES SPECIES ERADICATED, 1949
COEUR D'ALENE OPERATION

| Working | Eradication Type | Acres | Ribes Species | | | Total Ribes |
|--------------|------------------------|-------|----------------|---------------------|--------------|-------------|
| | | | Ribes lacustre | Ribes viscosissimum | Ribes inerme | |
| First | Reproduction (1910-39) | 50 | 1,017 | | | 1,017 |
| | Pole | 100 | 2,593 | 136 | | 2,729 |
| | Stream | 73 | 18,550 | | 18,550 | 37,100 |
| | Total | 223 | 22,160 | 136 | 18,550 | 40,846 |
| Second | Plantation (1945-49) | 50 | 637 | 169 | | 806 |
| | Plantation (1940-44) | 364 | 13,390 | 6,621 | | 20,011 |
| | Reproduction (1910-39) | 492 | 60,881 | 10,628 | | 71,509 |
| | Pole | 992 | 22,304 | 455 | | 22,759 |
| | Stream | 220 | 17,190 | | | 17,190 |
| | Total | 2,118 | 114,402 | 17,873 | | 132,275 |
| Third | Plantation (1940-44) | 24 | 707 | | | 707 |
| | Cutover (1920-39) | 130 | 7,528 | 396 | | 7,924 |
| | Reproduction (1910-39) | 1,925 | 24,646 | 5,478 | | 30,124 |
| | Pole | 75 | 537 | 1 | | 538 |
| | Stream | 132 | 30,010 | | | 30,010 |
| | Total | 2,286 | 63,428 | 5,875 | | 69,303 |
| All Workings | Plantation (1945-49) | 50 | 637 | 169 | | 806 |
| | Plantation (1940-44) | 388 | 14,097 | 6,621 | | 20,718 |
| | Cutover (1920-39) | 130 | 7,528 | 396 | | 7,924 |
| | Reproduction (1910-39) | 2,467 | 86,544 | 16,106 | | 102,650 |
| | Pole | 1,167 | 25,434 | 592 | | 26,026 |
| | Stream | 425 | 65,750 | | 18,550 | 84,300 |
| | Total | 4,627 | 199,990 | 23,884 | 18,550 | 242,424 |

TABLE 4
SUMMARY OF RIBES ERADICATION, 1927-1949
COEUR D'ALENE OPERATION

| Working | Eradication Type | Year of Origin | Gross Acres Worked | Man-Days | Ribes | Per Acre | | Net Acreage Remaining | |
|-------------|------------------|----------------|--------------------|----------|------------|----------|-------|-----------------------|----------|
| | | | | | | Man-Days | Ribes | Worked | Unworked |
| First | Plantation | 1945-49 | 968 | 578 | 33,013 | .60 | 34 | 968 | |
| | Burn | 1940-44 | 716 | 351 | 53,652 | .49 | 75 | 716 | |
| | Plantation | 1940-44 | 992 | 1,920 | 465,201 | 1.94 | 469 | 992 | 227 |
| | Cutover | 1940-44 | 632 | 508 | 64,145 | .80 | 101 | 632 | 10,136 |
| | Cutover | 1920-39 | 16,575 | 21,885 | 5,424,939 | 1.32 | 327 | 16,575 | 19,034 |
| | Reproduction | 1910-39 | 90,918 | 140,303 | 20,738,871 | 1.54 | 228 | 89,095 | 9,584 |
| | Pole | | 65,993 | 31,376 | 4,485,334 | .48 | 68 | 65,257 | 9,438 |
| | Mature | | 141,127 | 87,756 | 13,801,904 | .62 | 98 | 123,110 | 7,359 |
| | Miscellaneous | | 13,333 | 16,695 | 2,965,945 | 1.25 | 222 | 12,909 | 304 |
| | Stream (1) | | 14,982 | 58,506 | 11,883,182 | 3.91 | 793 | 14,874 | 2,541 |
| | Total | | 346,236 | 359,878 | 59,916,186 | 1.04 | 173 | 325,128 | 58,623 |
| Second | Plantation | 1945-49 | 50 | 34 | 806 | .68 | 16 | 50 | |
| | Plantation | 1940-44 | 982 | 1,839 | 150,971 | 1.87 | 154 | 982 | |
| | Cutover | 1940-44 | 34 | 18 | 241 | .53 | 7 | 34 | |
| | Cutover | 1920-39 | 9,452 | 13,447 | 1,975,736 | 1.42 | 209 | 9,452 | |
| | Reproduction | 1910-39 | 23,922 | 36,926 | 2,131,258 | 1.54 | 89 | 23,189 | |
| | Pole | | 6,592 | 5,063 | 528,948 | .77 | 80 | 5,592 | |
| | Mature | | 10,363 | 8,266 | 823,509 | .80 | 79 | 10,063 | |
| | Miscellaneous | | 1,585 | 2,963 | 358,052 | 1.87 | 226 | 1,585 | |
| | Stream (2) | | 8,368 | 15,417 | 1,658,754 | 1.84 | 198 | 8,260 | |
| | Total | | 61,348 | 83,973 | 7,628,275 | 1.37 | 124 | 60,207 | |
| Third | Plantation | 1940-44 | 918 | 1,347 | 63,978 | 1.47 | 70 | 918 | |
| | Cutover | 1920-39 | 5,023 | 9,424 | 449,654 | 1.88 | 90 | 5,023 | |
| | Reproduction | 1910-39 | 7,403 | 10,548 | 349,147 | 1.42 | 47 | 6,814 | |
| | Pole | | 1,812 | 1,594 | 80,411 | .88 | 44 | 1,812 | |
| | Mature | | 2,008 | 1,477 | 83,852 | .74 | 42 | 2,008 | |
| | Miscellaneous | | 61 | 72 | 3,569 | 1.18 | 59 | 61 | |
| | Stream (3) | | 1,864 | 3,262 | 180,746 | 1.75 | 97 | 1,846 | |
| | Total | | 19,089 | 27,724 | 1,211,357 | 1.45 | 63 | 18,482 | |
| GRAND TOTAL | | | 426,673 | 471,575 | 68,755,818 | 1.11 | 161 | 403,817 | |

Chemical work included above:

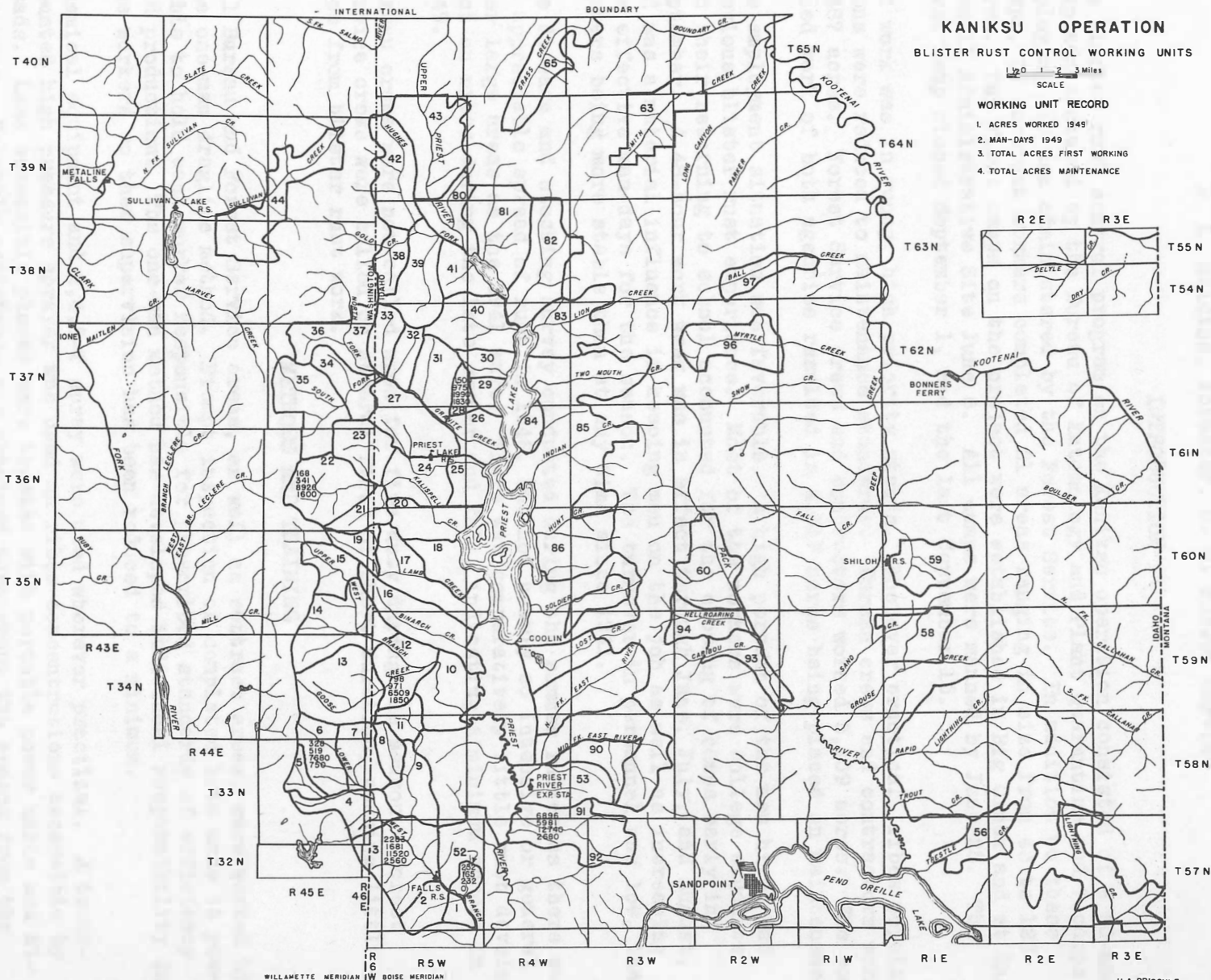
| | Acres | Man-Days | Gallons Spray |
|-----|-------|----------|---------------|
| (1) | 107 | 734 | 7,006 |
| (2) | 565 | 1,130 | 13,721 |
| (3) | 227 | 447 | 3,833 |

TABLE 5
SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1927-1949
COEUR D'ALENE OPERATION

| State | Class | Acres | Man-Days | Ribes | Gallons Spray | Per Acre | |
|-------|-----------|---------|----------|------------|---------------|----------|-------|
| | | | | | | Man-Days | Ribes |
| Idaho | EQ-Reg. | 25,776 | 8,351 | 2,846,383 | | .32 | 110 |
| | EQ-Emerg. | 41,039 | 35,541 | 6,589,217 | | .87 | 161 |
| | FS-Reg. | 98,833 | 119,860 | 15,520,800 | 24,560 | 1.21 | 157 |
| | FS-Emerg. | 111,711 | 86,897 | 17,620,173 | | .78 | 158 |
| | FS-Cont. | 1,043 | 924 | 33,786 | | .89 | 32 |
| | CCC | 148,271 | 220,002 | 26,145,459 | | 1.48 | 176 |
| | Total | 426,673 | 471,575 | 68,755,818 | 24,560 | 1.11 | 161 |

TABLE 6
OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1927-1949
COEUR D'ALENE OPERATION

| State | Ownership | Net Acres in Control Area | | | | | |
|-------|-----------------|---------------------------|--------|--------|---------|----------------|-------------|
| | | Acres Worked | | | | Acres Unworked | Total Acres |
| | | First | Second | Third | Total | | |
| Idaho | National Forest | 308,984 | 57,854 | 18,353 | 385,191 | 51,672 | 360,656 |
| | State | 5,427 | 440 | 45 | 5,912 | 711 | 6,138 |
| | Private | 10,717 | 1,913 | 84 | 12,714 | 6,240 | 16,957 |
| | Subtotal Other | 16,144 | 2,353 | 129 | 18,626 | 6,951 | 23,095 |
| | Total | 325,128 | 60,207 | 18,482 | 403,817 | 58,623 | 383,751 |



BLISTER RUST CONTROL, KANIKSU OPERATION, 1949

By

H. A. Brischle, Operation Supervisor
R. L. Hilding, Forester, U. S. Forest Service

INTRODUCTION

The blister rust control program on the Kaniksu operation consisted of a 30-man camp administered by the Bureau of Entomology and Plant Quarantine and 7 camps employing 113 men administered by the Forest Service. In addition to these camps, 30 contract workers completed 21 areas ranging in size from 43 to 123 acres. The first camps on the project were established in Big Creek and at the Boswell Administrative Site June 6. All camps were manned by June 25. The first camp closed September 1, and the last September 15.

All work was in young, high priority stands. Wherever practical, ribes populations were reduced to maintenance standards. Bureau crews and contractors worked 1,487 acres. Forest Service crews and contractors worked 5,409 acres. The combined work of both agencies resulted in 4,517 acres being placed on maintenance.

The employment situation was favorable. A high percent of the men hired had previous blister rust experience. Most of the workers were college students and their returning to school accounted for the closing of camps early in September. A 48-hour work week was in effect through June, July, and August, and was a material influence in keeping men on the job as well as increasing the effective man-days for the season. The turnover in personnel was low, the workers being more stable than at any time since 1941.

The disease and stocking survey conducted during the summer indicates there was an appreciable spread of rust in 1946, but not nearly so intensive or general over large areas as the 1941 wave. There was comparatively little rust development on ribes during the late summer and fall, indicating a minimum spread in 1949.

Bureau crews were not called upon for fire duty during the season. Forest Service crews were called on several fires of short duration, causing little loss from blister rust work.

METHODS AND TRAINING

All Bureau and Forest Service areas, as well as contract areas, were worked by the one-man dragline method. Prompt inspection of completed lots made it possible to hold each worker responsible for prescribed standards of efficiency and production. The one-man method has developed individual responsibility in the workers so that supervision has been reduced to a minimum.

Chemical equipment and 2,4,5-T spray were used wherever practical. A truck-mounted high pressure sprayer was used on ribes concentrations accessible by roads. Less accessible places were treated with portable power units and Hi-Fog guns. Valuable assistance was obtained throughout the season from the methods project in the application of methods and use of chemical equipment.

Due to the favorable results of contract work in 1948, this phase of the program was materially increased in 1949. Approximately 29 percent of the area worked by the Bureau and 24 percent of that worked by the Forest Service in 1949 were under contract.

Charts and illustrated material were used to train the men in proper work methods and in the use of tools and equipment. This was followed by periodic instruction throughout the summer. Athletic equipment was secured through donations from the workers. Softball and basketball games after work hours and over week ends proved valuable in building good camp morale.

CHECKING AND SURVEYS

A crew of 10 Forest Service and Bureau checkers did the necessary current and post check work. Checkers inspected the $1\frac{1}{4}$ -acre lots promptly upon completion to insure the quality of work. A sample random strip was run in each lot and all likely ribes sites were inspected. By this method, it is estimated at least 12 percent of the ground was inspected. Two Forest Service men were needed to lay out and check completed contract work.

In addition to the regular check, 8,585 acres were post checked and reclassified as 2,840 acres on maintenance and 5,745 acres needing rework. All areas set up for contract work were first post checked to determine as accurately as possible the existing ribes pattern and the need for working.

A six-man crew under the supervision of Robert S. Morgan, Forester, conducted a disease and stocking survey from June 1 to October 30. Its purpose was to obtain additional damage and stocking data in pole stands in order to adjust unit boundaries to meet pathological and physical requirements for feasible blister rust control units.

Surveys were made in 20 units in the Priest Lake drainage extending from the Lower West Branch through to the Upper Priest River drainage. Rust damage to pine on a quadrat basis for the units surveyed is as follows:

| | | | |
|---------------|-----|------------------|-----|
| Hughs Ridge | 12% | Kalispell Creek | 12% |
| Boulder Creek | 24% | Upper Lamb Creek | 11% |
| Zero Creek | 38% | Lamb Creek | 10% |
| Fedar Creek | 14% | Solo Creek | 23% |
| Tunnel Creek | 24% | Pelke | 16% |
| Kalispell Bay | 10% | Reeder Mountain | 25% |

Upper Priest was surveyed for the first time; damage above Rock Creek was found to be 74 percent or almost a complete loss of the present stand of white pine. Other areas lost to white pine are Tillicum Creek, Cache Creek, south fork of Granite Creek, Upper Hughs Fork, and Quartz Creek.

In addition to damage and stocking data, the crew also recorded information on pole blight which was submitted to the Division of Forest Pathology. Pole blight has been found in the Lower West Branch, Binarch Creek, Lamb Creek, and Reeder Mountain areas.

LOCATION AND DESCRIPTION OF AREAS

Bureau Camp 401

Located at the forks of Big Creek in working unit 92. Work was completed on 1,061 acres at the rate of .81 man-day per acre; 28 ribes per acre were removed. As a result of this work, 350 acres were placed on maintenance and 711 were placed in the post check category. Future work in the drainage will be confined to stream type and isolated patches of upland which can be worked to advantage by contractors. The Big Creek drainage has presented a ribes control problem due to conditions following logging and a 1931 burn.

The initial strength of the camp was 30 men. Ten men took ribes eradication contracts during July and August when six contract areas were awarded.

Bureau Contract Work

Contracts totaling 626 acres and obligating \$4,448.76 were awarded to low bidders for the eradication of ribes on 6 areas in the Fox Creek drainage. Four areas amounting to 426 acres were completed to specifications; time was extended on 2 until 1950. Accepted prices ranged from \$9.74 to \$12.41 per acre. The average total cost was \$12.22 per acre after estimated administrative costs of \$2 per acre were added. As a result of the work, the entire 626 acres were placed on maintenance. Additional contracts to complete all necessary work in Fox Creek are planned for 1950.

Forest Service Camp 400

Located at Blister Rust Control Headquarters, Kalispell Bay. The first 2 weeks in July a crew of 10 men completed the necessary work on 63 acres of upland adjacent to white pine plantations in Kalispell Bay working unit No. 20. After mid-July, a three-man crew was trained to operate a truck-mounted high pressure spray unit. This unit, using 2,4,5-T spray, was used to treat small Ribes lacustre and R. viscosissimum adjacent to plantations in the vicinity of Diamond Peak. Ribes were associated with other low brush which necessitated covering the area by the broadcast method. An area of 37 acres was covered at the rate of 2.81 man-days per acre. It is estimated that 37,000 ribes were treated. In August, the men and equipment were moved to Forest Service Camp 451 where 13 acres of recent cutover supporting many small ribes were treated. This area is adjacent to the South Baldy plantation. It was treated at the rate of 1.54 man-days per acre. It is estimated 23,400 R. lacustre and R. viscosissimum were treated.

Forest Service Camp 451

Camp 451 was located near the Boswell Administrative Site. Areas worked were in the South Baldy, Pee Wee Creek, and Tunnel Creek plantations. Pee Wee and Tunnel Creek plantings are on recent control burns. Protection of these planted areas involved the removal of large ribes from the unburned portions as well as ribes seedlings from the newly planted burn. In addition to 583 acres of plantation, this camp completed work on 1,544 acres in reproduction and cutover type. As a result of this work, 1,224 acres of 1910-39 reproduction were placed on maintenance.

Forest Service Camp 452

Camp 452 was located near the Pelke Administrative Site. Men were housed in permanent camp-type buildings constructed in 1948 in cooperation with the Falls Ranger District. Buildings and facilities are shared jointly with the district crews, thus minimizing equipment rental costs and the cost of constructing and dismantling temporary camps.

The camp worked 798 acres in reproduction and cutover stands within the Pelke unit. As a result of the season's work, 268 acres were placed on maintenance.

Forest Service Camp 453

Located on Fedar Creek, a tributary of Granite Creek. This area is known as the Fedar Creek unit and comprises 1,990 acres; 1,331 are plantation and young natural white pine stands. As a result of this year's work, the entire unit has been placed on maintenance.

If sound timber management is practiced, this unit should require a minimum of future blister rust control work to carry the existing young stands through to maturity.

Forest Service Camp 454

Camp 454 was a 12-man pack camp located along the ridge between Hungry Mountain and Kalispell Rock. Work started in 1948 was continued. Hi-Fog guns were used to apply 2,4,5-T spray to numerous large ribes intermingled with brush. Many windfalls and the brush made it impractical to continue with spray equipment, and plans were made for a control burn. Early damp weather prevented carrying out this plan. It is hoped conditions will be favorable for burning in 1950. After the area is burned, it will be an integral part of the existing plantation and can be planted to desirable species.

From observations made during the summer, it appears that approximately 85 percent of the R. lacustre and R. viscosissimum treated in 1948 were dead. Present plans are to continue with Hi-Fog spray work between Gleason Mountain and Hungry Mountain in 1950.

Forest Service Contract Work

Seventeen contract areas totaling 1,299 acres were completed by contractors during the year. The areas are all in the Lower West Branch drainage and ranged in size from 57 acres to 123 acres. The 1949 contract prices varied from \$8.23 to \$16.50 per acre, depending on working conditions. The average net price paid to contractors was \$12.44. Estimated administrative costs were \$3 per acre, making the total cost \$15.44.

Contract work started early in April and continued through September. No areas were checked for payment after September 15 due to early defoliation of ribes. All areas approved for payment were worked to contract specifications and resulted in the completion of 1,299 acres, 53 percent of which was placed on maintenance.

The 17 completed contract areas were awarded to 11 different contractors. Approximately 30 men participated in the work. All contractors who carried on their job in a businesslike manner were able to show a good rate of pay for their work. One of the main difficulties experienced by most contractors is the inability to properly subsist themselves. In time, contractors will become better equipped and overcome some of the obstacles encountered during the past season.

In addition to the completed work, there are 20 areas involving 1,737 acres on which awards were made late in the year, or time extended to June 30, 1950. The total obligated amount for 1949, completed and incompleted contracts, is \$41,625. The outlook for contract work in the future is favorable. Bidding on all areas has been spirited and highly competitive.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures is shown in the following table:

TABLE 1

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1949 KANIKSU OPERATION

| Item | Bureau of Entomology & Plant Quarantine | | | | | Forest Service BLR-4 | Total |
|----------------------|---|---------------------|--------------------|----------|----------|-------------------------|-----------|
| | BLR-1-4 | Cooperative Control | | | Total | | |
| | | Federal BLR-3-4 | State & Private | Total | | | |
| Contract ribes erad. | | \$ 4,586 | | \$ 4,586 | \$ 4,586 | \$ 16,158 | \$ 20,744 |
| Salary perm. men | \$ 9,291 | 789 | | 789 | 10,080 | 11,125 | 21,205 |
| Salary temp. men | 158 | 867 | \$ 1,952 | 2,819 | 2,977 | 13,120 | 16,097 |
| Wages temp. laborers | 120 | 2,562 | 8,269 | 10,831 | 10,951 | 69,277 | 80,228 |
| Subsistence supplies | 138 | 1,880 | | 1,880 | 2,018 | 20,165 | 22,183 |
| Equipment | 215 | 57 | | 57 | 272 | 1,461 | 1,733 |
| Travel and transp. | 833 | 374 | | 374 | 1,207 | 3,313 | 4,520 |
| Other expenses | 913 | 842 | | 842 | 1,755 | 8,472 | 10,227 |
| Total | \$11,668 | \$11,957 | \$10,221 | \$22,178 | \$33,846 | \$143,091 | \$176,937 |

TABLE 2

SUMMARY OF RIBES ERADICATION, 1949
KANIKSU OPERATION

| Working | Eradication Type | Year of Origin | Acres | Man-Days | Ribes | Per Acre | |
|---------|------------------|----------------|-------|----------|---------|----------|-------|
| | | | | | | Man-Days | Ribes |
| First | Plantation | 1945-49 | 268 | 342 | 10,373 | 1.28 | 39 |
| | Cutover | 1945-49 | 81 | 131 | 7,827 | 1.62 | 97 |
| | Cutover | 1940-44 | 30 | 22 | 1,042 | .73 | 35 |
| | Reproduction (1) | 1910-39 | 147 | 299 | 44,033 | 2.03 | 300 |
| | Pole (2) | | 12 | 49 | 7,260 | 4.08 | 605 |
| | Total | | 538 | 843 | 70,535 | 1.57 | 131 |
| Second | Cutover | 1940-44 | 142 | 39 | 326 | .27 | 2 |
| | Cutover | 1920-39 | 833 | 928 | 14,016 | 1.11 | 17 |
| | Reproduction (3) | 1910-39 | 979 | 392 | 14,404 | .40 | 15 |
| | Pole | | 324 | 98 | 884 | .30 | 3 |
| | Total | | 2,278 | 1,457 | 29,630 | .64 | 13 |
| | Plantation | 1945-49 | 315 | 499 | 29,282 | 1.58 | 93 |
| Third | Cutover (4) | 1940-44 | 240 | 193 | 29,079 | .80 | 121 |
| | Cutover | 1920-39 | 1,287 | 778 | 23,763 | .60 | 18 |
| | Reproduction (5) | 1910-39 | 1,856 | 1,874 | 67,120 | 1.01 | 36 |
| | Pole | | 185 | 85 | 984 | .46 | 5 |
| | Mature | | 43 | 9 | 62 | .21 | 1 |
| | Stream | | 154 | 243 | 4,422 | 1.58 | 29 |
| | Total | | 4,080 | 3,681 | 154,712 | .90 | 38 |
| | GRAND TOTAL | | 6,896 | 5,981 | 254,877 | .87 | 37 |

Chemical work included above:

Upland

| | Acres | | Gallons | |
|-----|----------|-----|----------|--|
| | Man-Days | | Spray | |
| (1) | 65 | 253 | 1,323 | |
| (2) | 12 | 49 | 434 | |
| (3) | 91 | 39 | 191 | |
| (4) | 13 | 20 | 3,000 * | |
| (5) | 37 | 104 | 13,700 * | |

* Broadcast spraying 2,4,5-T

TABLE 3

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1949
KANIKSU OPERATION

| State | Working | Class | Acres | Man-Days | Ribes | Gallons Spray | Per Acre | |
|------------|--------------|----------|-------|----------|---------|---------------|----------|-------|
| | | | | | | | Man-Days | Ribes |
| Idaho | First | FS-Reg. | 461 | 541 | 20,825 | | 1.17 | 45 |
| | | EQ-Coop. | 85 | 26 | 679 | | .31 | 8 |
| | Second | FS-Reg. | 1,661 | 1,123 | 13,449 | | .68 | 8 |
| | | FS-Cont. | 441 | 269 | 7,821 | | .61 | 18 |
| | | Total | 2,187 | 1,418 | 21,949 | | .65 | 10 |
| | Third | EQ-Coop. | 976 | 830 | 28,561 | | .85 | 29 |
| | | EQ-Cont. | 426 | 254 | 1,656 | | .60 | 4 |
| | | FS-Reg. | 1,449 | 1,054 | 13,864 | | .73 | 10 |
| | | FS-Cont. | 758 | 836 | 16,360 | | 1.10 | 22 |
| | | Total | 3,609 | 2,974 | 60,441 | | .82 | 17 |
| | All Workings | EQ-Coop. | 1,061 | 856 | 29,240 | | .81 | 28 |
| | | EQ-Cont. | 426 | 254 | 1,656 | | .60 | 4 |
| | | FS-Reg. | 3,571 | 2,718 | 48,138 | | .76 | 13 |
| | | FS-Cont. | 1,199 | 1,105 | 24,181 | | .92 | 20 |
| | | Total | 6,257 | 4,933 | 103,215 | | .79 | 16 |
| Washington | First | FS-Reg. | 77 | 302 | 49,710 | 1,752 | 3.92 | 646 |
| | Second | FS-Reg. | 91 | 39 | 7,681 | 191 | .43 | 84 |
| | Third | FS-Reg. | 371 | 630 | 89,744 | 16,700 | 1.70 | 242 |
| | | FS-Cont. | 100 | 77 | 4,527 | | .77 | 45 |
| | | Total | 471 | 707 | 94,271 | 16,700 | 1.50 | 200 |
| | All Workings | FS-Reg. | 539 | 971 | 147,135 | 18,643 | 1.80 | 273 |
| | | FS-Cont. | 100 | 77 | 4,527 | | .77 | 45 |
| | | Total | 639 | 1,048 | 151,662 | 18,643 | 1.64 | 237 |
| Total | First | FS-Reg. | 538 | 843 | 70,535 | 1,752 | 1.57 | 131 |
| | | EQ-Coop. | 85 | 26 | 679 | | .31 | 8 |
| | Second | FS-Reg. | 1,752 | 1,162 | 21,130 | 191 | .66 | 12 |
| | | FS-Cont. | 441 | 269 | 7,821 | | .61 | 18 |
| | | Total | 2,278 | 1,457 | 29,630 | 191 | .64 | 13 |
| | Third | EQ-Coop. | 976 | 830 | 28,561 | | .85 | 29 |
| | | EQ-Cont. | 426 | 254 | 1,656 | | .60 | 4 |
| | | FS-Reg. | 1,820 | 1,684 | 103,608 | 16,700 | .93 | 57 |
| | | FS-Cont. | 858 | 913 | 20,887 | | 1.06 | 24 |
| | | Total | 4,080 | 3,681 | 154,712 | 16,700 | .90 | 38 |
| | All Workings | EQ-Coop. | 1,061 | 856 | 29,240 | | .81 | 28 |
| | | EQ-Cont. | 426 | 254 | 1,656 | | .60 | 4 |
| | | FS-Reg. | 4,110 | 3,689 | 195,273 | 18,643 | .90 | 48 |
| | | FS-Cont. | 1,299 | 1,182 | 28,708 | | .91 | 22 |
| | | Total | 6,896 | 5,981 | 254,877 | 18,643 | .87 | 37 |

TABLE 4

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1949
KANIKSU OPERATION

| State | Working | Acres Worked | | | | | | | | |
|------------|---------|-------------------|---------|-------|---------|-----------------|-------------|---------|-------|-------------|
| | | By Forest Service | | | By BEPQ | Total Federal | Total Other | | | GRAND TOTAL |
| | | National Forest | Private | Total | State | National Forest | State | Private | Total | |
| Idaho | First | 421 | 40 | 461 | | 421 | | 40 | 40 | 461 |
| | Second | 1,930 | 172 | 2,102 | 85 | 1,930 | 85 | 172 | 257 | 2,187 |
| | Third | 1,906 | 301 | 2,207 | 1,402 | 1,906 | 1,402 | 301 | 1,703 | 3,609 |
| | Total | 4,257 | 513 | 4,770 | 1,487 | 4,257 | 1,487 | 513 | 2,000 | 6,257 |
| Washington | First | 77 | | 77 | | 77 | | | | 77 |
| | Second | 91 | | 91 | | 91 | | | | 91 |
| | Third | 324 | 147 | 471 | | 324 | | 147 | 147 | 471 |
| | Total | 492 | 147 | 639 | | 492 | | 147 | 147 | 639 |
| Total | First | 498 | 40 | 538 | | 498 | | 40 | 40 | 538 |
| | Second | 2,021 | 172 | 2,193 | 85 | 2,021 | 85 | 172 | 257 | 2,278 |
| | Third | 2,230 | 448 | 2,678 | 1,402 | 2,230 | 1,402 | 448 | 1,850 | 4,080 |
| | Total | 4,749 | 660 | 5,409 | 1,487 | 4,749 | 1,487 | 660 | 2,147 | 6,896 |

TABLE 5

RIBES SPECIES ERADICATED, 1949
KANIKSU OPERATION

| Working | Eradication Type | Acres | Ribes Species | | | Total Ribes |
|-----------------|------------------------|-------|-------------------|------------------------|------------------|----------------|
| | | | Ribes lacustre | Ribes viscosissimum | Ribes inermis | |
| First | Plantation (1945-49) | 268 | 1,935 | 8,438 | | 10,373 |
| | Cutover (1945-49) | 81 | 260 | 7,567 | | 7,827 |
| | Cutover (1940-44) | 30 | 262 | 1 | 779 | 1,042 |
| | Reproduction (1910-39) | 147 | 8,084 | 35,941 | 8 | 44,033 |
| | Pole | 12 | 1,870 | 5,390 | | 7,260 |
| | Total | 538 | 12,411 | 57,337 | 787 | 70,535 |
| Second | Cutover (1940-44) | 142 | 273 | 13 | 40 | 326 |
| | Cutover (1920-39) | 833 | 7,544 | 6,331 | 141 | 14,016 |
| | Reproduction (1910-39) | 979 | 4,066 | 10,026 | 312 | 14,404 |
| | Pole | 324 | 362 | 522 | | 884 |
| | Total | 2,278 | 12,245 | 16,892 | 493 | 29,630 |
| Third | Plantation (1945-49) | 315 | 3,216 | 26,055 | 11 | 29,282 |
| | Cutover (1940-44) | 240 | 7,163 | 21,916 | | 29,079 |
| | Cutover (1920-39) | 1,287 | 15,788 | 7,707 | 268 | 23,763 |
| | Reproduction (1910-39) | 1,856 | 12,915 | 50,079 | 4,126 | 67,120 |
| | Pole | 185 | 509 | 209 | 266 | 984 |
| | Mature | 43 | 48 | 14 | | 62 |
| | Stream | 154 | 2,605 | | 1,817 | 4,422 |
| | Total | 4,080 | 42,244 | 105,980 | 6,488 | 154,712 |
| All Workings | Plantation (1945-49) | 583 | 5,151 | 34,493 | 11 | 39,655 |
| | Cutover (1945-49) | 81 | 260 | 7,567 | | 7,827 |
| | Cutover (1940-44) | 412 | 7,698 | 21,930 | 819 | 30,447 |
| | Cutover (1920-39) | 2,120 | 23,332 | 14,038 | 409 | 37,779 |
| | Reproduction (1910-39) | 2,982 | 25,065 | 96,046 | 4,446 | 125,557 |
| | Pole | 521 | 2,741 | 6,121 | 266 | 9,128 |
| | Mature | 43 | 48 | 14 | | 62 |
| | Stream | 154 | 2,605 | | 1,817 | 4,422 |
| | Total | 6,896 | 66,900 | 180,209 | 7,768 | 254,877 |

TABLE 6

SUMMARY OF RIBES ERADICATION, 1923-1949
KANIKSU OPERATION

| Working | Eradication Type | Year of Origin | Gross Acres Worked | Man-Days | Ribes | Per Acre | | Net Acreage Remaining | |
|-------------|-------------------|----------------|--------------------|----------|------------|----------|-------|-----------------------|----------|
| | | | | | | Man-Days | Ribes | Worked | Unworked |
| First | Burn | 1945-49 | 243 | 548 | 111,750 | 2.26 | 460 | 243 | |
| | Plantation | 1945-49 | 298 | 359 | 11,971 | 1.20 | 40 | 298 | 205 |
| | Cutover | 1945-49 | 1,105 | 1,172 | 163,163 | 1.06 | 148 | 1,105 | 7,395 |
| | Burn | 1940-44 | 210 | 184 | 47,333 | .88 | 225 | 210 | |
| | Plantation | 1940-44 | 2,631 | 1,317 | 490,404 | .50 | 186 | 2,631 | |
| | Cutover (4) | 1940-44 | 4,688 | 3,699 | 690,602 | .79 | 147 | 4,688 | 35,846 |
| | Cutover | 1920-39 | 12,147 | 8,924 | 1,875,327 | .73 | 154 | 11,573 | 24,406 |
| | Reproduction (5) | 1910-39 | 167,303 | 119,924 | 32,877,424 | .72 | 197 | 160,684 | 24,410 |
| | Pole (6) | | 129,971 | 45,862 | 6,365,218 | .35 | 49 | 128,656 | 23,852 |
| | Mature | | 142,774 | 30,837 | 5,824,592 | .22 | 41 | 110,479 | 39,296 |
| | Miscellaneous | | 7,387 | 5,011 | 1,995,603 | .68 | 270 | 6,024 | 1,277 |
| | Stream (1) | | 22,927 | 50,273 | 9,390,276 | 2.19 | 410 | 22,283 | 6,889 |
| Second | Total | | 491,684 | 268,110 | 59,843,663 | .55 | 122 | 448,874 | 163,576 |
| | Plantation | 1945-49 | 295 | 471 | 115,811 | 1.60 | 393 | 295 | |
| | Plantation | 1940-44 | 2,631 | 1,435 | 50,089 | .55 | 19 | 2,631 | |
| | Cutover | 1940-44 | 707 | 376 | 10,796 | .53 | 15 | 707 | |
| | Cutover | 1920-39 | 8,459 | 9,985 | 1,836,299 | 1.18 | 217 | 8,459 | |
| | Reproduction (7) | 1910-39 | 55,961 | 46,658 | 5,716,872 | .83 | 102 | 55,053 | |
| | Pole (8) | | 39,075 | 17,046 | 1,160,908 | .44 | 30 | 39,075 | |
| | Mature | | 7,372 | 4,044 | 360,045 | .55 | 49 | 7,372 | |
| | Miscellaneous | | 1,377 | 656 | 47,147 | .48 | 34 | 1,377 | |
| | Stream (2) | | 12,342 | 16,412 | 1,507,256 | 1.33 | 122 | 12,287 | |
| Third | Total | | 128,219 | 97,083 | 10,805,223 | .76 | 84 | 127,256 | |
| | Plantation | 1945-49 | 315 | 499 | 29,282 | 1.58 | 93 | 315 | |
| | Plantation | 1940-44 | 1,933 | 480 | 13,310 | .25 | 7 | 1,933 | |
| | Cutover (9) | 1940-44 | 386 | 278 | 29,788 | .72 | 77 | 386 | |
| | Cutover | 1920-39 | 7,795 | 6,131 | 423,391 | .79 | 54 | 7,795 | |
| | Reproduction (10) | 1910-39 | 20,362 | 18,617 | 1,294,937 | .91 | 64 | 20,362 | |
| | Pole (11) | | 2,519 | 780 | 67,095 | .31 | 27 | 2,519 | |
| | Mature | | 1,299 | 697 | 107,927 | .54 | 83 | 1,299 | |
| | Miscellaneous | | 637 | 288 | 5,587 | .45 | 9 | 637 | |
| | Stream (3) | | 1,989 | 2,361 | 94,516 | 1.19 | 48 | 1,989 | |
| GRAND TOTAL | Total | | 37,235 | 30,131 | 2,065,833 | .81 | 55 | 37,235 | |
| | GRAND TOTAL | | 657,138 | 395,324 | 72,714,719 | .60 | 111 | 613,365 | |

Chemical work included above:

Stream

Upland

| | Stream | | | Upland | | |
|-----|--------|----------|---------------|--------|----------|---------------|
| | Acres | Man-Days | Gallons Spray | Acres | Man-Days | Gallons Spray |
| (1) | 90 | 109 | 3,704 | (4) | 347 | 283 |
| (2) | 20 | 21 | 199 | (5) | 296 | 390 |
| (3) | 47 | 15 | 150 | (6) | 12 | 49 |
| | | | | (7) | 101 | 44 |
| | | | | (8) | 57 | 46 |
| | | | | (9) | 13 | 20 |
| | | | | (10) | 42 | 107 |
| | | | | (11) | 51 | 55 |
| | | | | | | |

TABLE 7

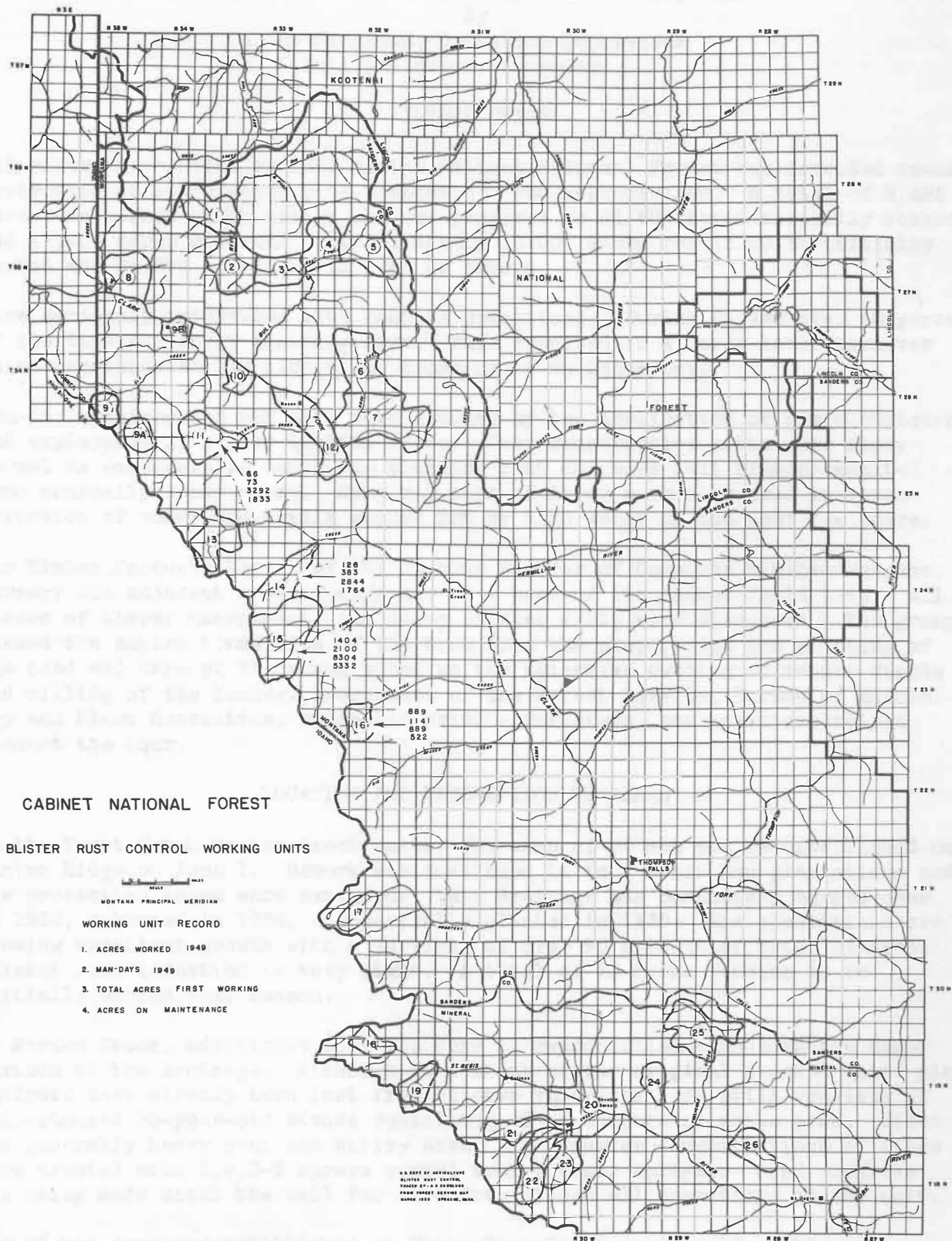
SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1923-1949
KANIKSU OPERATION

| State | Class | Gross Acres | Man-Days | Total Ribes | Gallons Spray | Per Acre | |
|------------|-----------|-------------|----------|-------------|---------------|----------|-------|
| | | | | | | Man-Days | Ribes |
| Idaho | EQ-Reg. | 18,796 | 6,844 | 1,066,689 | | .36 | 57 |
| | EQ-Coop. | 163,762 | 66,437 | 12,013,990 | 1,979 | .41 | 73 |
| | EQ-Cont. | 426 | 254 | 1,656 | | .60 | 4 |
| | EQ-Emerg. | 99,041 | 68,851 | 11,333,497 | | .70 | 114 |
| | FS-Reg. | 57,127 | 51,474 | 5,318,968 | 3,374 | .90 | 93 |
| | FS-Cont. | 2,029 | 1,561 | 31,890 | | .77 | 16 |
| | FS-Emerg. | 99,269 | 38,823 | 8,788,474 | | .39 | 89 |
| | CCC | 62,419 | 50,478 | 8,451,835 | | .81 | 135 |
| | Total | 502,869 | 284,722 | 47,006,999 | 5,353 | .57 | 93 |
| Washington | EQ-Emerg. | 31,629 | 19,288 | 6,754,071 | | .61 | 214 |
| | FS-Reg. | 63,846 | 52,146 | 11,448,629 | 27,445 | .82 | 179 |
| | FS-Cont. | 100 | 77 | 4,527 | | .77 | 45 |
| | FS-Emerg. | 36,366 | 14,386 | 4,013,260 | | .40 | 110 |
| | CCC | 22,328 | 24,705 | 3,487,233 | | 1.11 | 156 |
| | Total | 154,269 | 110,602 | 25,707,720 | 27,445 | .72 | 167 |
| Total | EQ-Reg. | 18,796 | 6,844 | 1,066,689 | | .36 | 57 |
| | EQ-Coop. | 163,762 | 66,437 | 12,013,990 | 1,979 | .41 | 73 |
| | EQ-Cont. | 426 | 254 | 1,656 | | .60 | 4 |
| | EQ-Emerg. | 130,670 | 88,139 | 18,087,568 | | .67 | 138 |
| | FS-Reg. | 120,973 | 103,620 | 16,767,597 | 30,819 | .86 | 139 |
| | FS-Cont. | 2,129 | 1,638 | 36,417 | | .77 | 17 |
| | FS-Emerg. | 135,635 | 53,209 | 12,801,734 | | .39 | 94 |
| | CCC | 84,747 | 75,183 | 11,939,068 | | .89 | 141 |
| | Total | 657,138 | 395,324 | 72,714,719 | 32,798 | .60 | 111 |

TABLE 8

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1923-1949
KANIKSU OPERATION

| State | Ownership | Net Acres in Control Area | | | | | |
|------------|------------------|---------------------------|---------|--------|---------|----------------|-------------|
| | | Acres Worked | | | | Acres Unworked | Total Acres |
| | | First | Second | Third | Total | | |
| Idaho | National Forest | 181,188 | 50,332 | 8,107 | 239,627 | 54,521 | 235,709 |
| | Public Domain | 54 | | | 54 | 80 | 134 |
| | Subtotal Federal | 181,242 | 50,332 | 8,107 | 239,681 | 54,601 | 235,843 |
| | State | 103,915 | 28,351 | 14,131 | 146,397 | 31,122 | 135,037 |
| | Private | 66,476 | 16,670 | 4,048 | 87,194 | 43,611 | 110,087 |
| | Subtotal Other | 170,391 | 45,021 | 18,179 | 233,591 | 74,733 | 245,124 |
| | Total | 351,633 | 95,353 | 26,286 | 473,272 | 129,334 | 480,967 |
| Washington | National Forest | 90,049 | 29,915 | 10,454 | 130,418 | 30,599 | 120,648 |
| | State | 2,080 | 80 | | 2,160 | | 2,080 |
| | Private | 5,112 | 1,908 | 495 | 7,515 | 3,643 | 8,755 |
| | Subtotal Other | 7,192 | 1,988 | 495 | 9,675 | 3,643 | 10,835 |
| | Total | 97,241 | 31,903 | 10,949 | 140,093 | 34,242 | 131,483 |
| Total | National Forest | 271,237 | 80,247 | 18,561 | 370,045 | 85,120 | 356,357 |
| | Public Domain | 54 | | | 54 | 80 | 134 |
| | Subtotal Federal | 271,291 | 80,247 | 18,561 | 370,099 | 85,200 | 356,491 |
| | State | 105,995 | 28,431 | 14,131 | 148,557 | 31,122 | 137,117 |
| | Private | 71,588 | 18,578 | 4,543 | 94,709 | 47,254 | 118,842 |
| | Subtotal Other | 177,583 | 47,009 | 18,674 | 243,266 | 78,376 | 255,959 |
| | Total | 448,874 | 127,256 | 37,235 | 613,365 | 163,576 | 612,450 |



BLISTER RUST CONTROL, CABINET OPERATION, 1949

By

A. S. Skoglund, Operation Supervisor

Neil Fullerton, Forester

INTRODUCTION

All ribes eradication in 1949 in the Cabinet National Forest was directed toward protection of young white pine plantations and reproduction. A total of 2,485 acres was worked which brings the net progress to 81,629 acres initially worked and 17,405 acres reworked. Approximately 13,000 acres remain to be initially worked and 24,893 acres are in need of rework.

Fire seriously interfered with control operations. During August over 40 percent of the time was spent fighting fire. This resulted in a large labor turnover which necessitated the closing of camps prior to Labor Day.

Man-day requirements per acre were reduced by the application of new techniques and employment of higher quality labor. Camp construction costs were above normal as considerable damage to standing tent and mess hall frames resulted from unusually heavy snows. Many man-days of labor were also used in reconstruction of roads and trails washed out by high water of the past few years.

The Timber Products Bureau of the Spokane Chamber of Commerce visited Savenac Nursery and adjacent areas during May as a part of its annual field trip. All phases of timber management, including blister rust, were discussed. The group viewed the entire transition of the tree from the preparation and planting of the seed and care of the young stock to the selective cutting of mature stands and milling of the lumber. Personnel of the Forest Service, Bureau of Entomology and Plant Quarantine, state and private foresters, and operators helped conduct the tour.

LOCATION AND DESCRIPTION OF AREAS

In the Trout Creek-Marten Creek units, one camp of 90 men was re-established on Minton Ridge on June 1. Rework was continued in four Robin Run plantations and the protection zones were extended. This drainage was completely burned over in 1910, reburned in 1934, and partially planted in 1939. The plantations are showing excellent growth with a survival of over 90 percent of trees planted. Blister rust infection is very light. A total of 75 acres remains to be initially worked next season.

In Marten Creek, additional work was done in reproduction stands in the upper portion of the drainage. Although 20 percent of the original stocked white pine quadrats have already been lost from blister rust, the area still consists of well-stocked 30-year-old stands containing 40 to 50 percent white pine. Ribes are generally heavy over the entire area. The heavier concentrations of ribes were treated with 2,4,5-T sprays pumped from a power sprayer. Good progress was being made until the call for fire duty closed all operations in the unit.

One 33-man camp was established on White Pine Creek on June 13. This area was burned in 1910 and planted in 1931. The unit contains approximately 1,200 acres

of which 700 acres are well stocked reproduction stands and plantations of 50 to 75 percent white pine. Blister rust infection is very light and little damage has occurred. The area was not completed due to heavy turnover of overhead and crewmen

METHODS AND TRAINING

All men were trained in use of the one-man dragline system. In this method of ribes eradication, a crewman was assigned to a lane $2\frac{1}{2}$ chains wide and laid out in 5-chain long blocks. Generally the lanes were worked from the top toward the bottom with the crewman pulling his dragline as he worked along. When it was necessary to start at the bottom of a lane, the individual always laid his dragline in advance of actual work. Men especially trained in compass and pacing were used to lay out all lanes and blocks. Every other lane was permanently marked to facilitate relocation.

A Friend power sprayer was used to apply 2,4,5-T sprays to heavy concentrations of ribes in Marten Creek. Water was supplied to the sprayer by the 500-gallon tank truck that furnished water to the camp. About three-fourths mile of main line hose was laid downhill from the sprayer located on the road. Four lateral spray hoses were used from the main line with a pressure of 125 pounds.

Knapsack units were used to spray ribes along streams. All chemical work appeared to be effective. Ribes triste and R. inermis sprayed in 1948 were completely killed by one application of 2,4,5-T spray.

Every man reporting to the job received the same thorough and systematic program of training. Differences in production accomplishments during the season were due entirely to individual abilities.

One ribes eradication contract was executed on 66 acres in Pilgrim Creek. The cost amounted to \$23.50 per acre including layout and checking charges. While no saving was made, the contract was awarded in expectation of gains to be made in the future through competitive bidding.

SAFETY

The vigorous safety program employed during the past several years has produced results. In 1949 there were four reportable accidents and no lost time accidents which means that no field time was lost due to injuries. There has also been a noticeable saving of equipment and supplies from accidental damage. Adequate training during the indoctrination period followed up with regularly scheduled safety meetings has impressed upon the individuals the value and necessity of safety consciousness.

CHECKING AND SURVEYS

A crew of three checkers under the direction of a checker foreman checked all worked area. In addition, they ran a post check on 2,500 acres in McKay Creek to determine the status of these areas initially worked in 1934.

The intensive checking procedure adopted for checking of one-man lanes has accomplished two things. It has resulted in a higher percent check of areas at no additional cost and has assisted eradication crews to achieve higher standards of work. Greater efficiency is attained by designating rework areas in small units.

A crew of three men was trained to do stocking and disease survey. The same procedure was used as that adopted for last season. Surveys were not completed for Pilgrim and Rock Creeks. Results are summarized in the following analysis.

WHITE PINE STOCKING AND BLISTER RUST LOSS SURVEY

| Unit | Class | No. Chains | Total Stocking | Percent White Pine Stocking | Percent Damage |
|----------------|---------|------------|----------------|-----------------------------|----------------|
| Dry Cr. | 2 | 233 | Well | 29 | 18 |
| | 3A & 3B | 446 | Medium | 9 | 34 |
| Star Gulch | 3B | 254 | Medium | 5 | 31 |
| Rock Cr. | 2 | 683 | Medium | 12 | 3 |
| | 3A & 3B | 803 | Medium | 3 | 13 |
| McKay Cr. | 2 | 481 | Well | 32 | 6 |
| | 3A & 3B | 1,185 | Medium | 6 | 6 |
| Trout Cr. | 1 & 2 | 1,540 | Well | 65 | 10 |
| | 3B | 230 | Light | 80 | 17 |
| White Pine Cr. | 1 & 2 | 651 | Medium | 70 | 2 |
| | 3A & 3B | 254 | Light | 37 | 8 |
| W. F. Big Cr. | 1 & 2 | 416 | Medium | 40 | 47 |
| | 3A | 241 | Medium | 9 | 42 |
| M. F. Big Cr. | 1 | 190 | Medium | 60 | 47 |
| | 3A & 3B | 163 | Medium | 6 | 35 |

CONTROL STATUS

A total of 43,925 acres is now on maintenance which represents 54 percent of the worked area. Of the 2,485 acres worked this season, 1,237 acres are on maintenance, 546 acres are on post check, and 702 acres are on rework.

An examination of 9,000 white pine transplants in Savenac Nursery revealed less than .1 percent blister rust infection. This reduction in infection from a high of .447 percent in 1942 is largely due to the removal of ribes from Haugan Look-out. However, as it is essential that the ribes in the immediate stream type be kept at a minimum, the stream type on Big Creek and Savenac Creek in the nursery zone should be worked by a few men early next season.

Reproduction stands in the St. Regis River units are in a critical stage as from now on there will be severe damage to the stands. Progress that will be made in the protection of these stands in the next two years will largely determine the final stocking. In Rivers Creek and the canyon portion of the middle fork of Big Creek, blister rust damage is so extensive that no further control work is warranted. In the unworked unit of Deer Creek, damage is so great that no ribes eradication should be performed prior to rehabilitation.

Since inception of the blister rust program in 1934, there has been little disturbance of the control areas. Fire has caused no damage to the stocking in any of the control units. Marten Creek is the only control unit from which any timber has been cut. In this unit, upon the removal of all merchantable products, the area will be burned and planted. Fifty-seven acres of pole timber were destroyed by three snow slides in 1937 on the east fork of Bull River.

The first indication of any pole blight in the Cabinet Forest was observed in Blue Creek in 1945. Pole blight has now been found in all drainages in the control units along Bull River as well as in Rock Creek and Smeads bench. Extensive damage occurs in Engle fork of Rock Creek and Snake Creek in the east fork of Bull River. Several plots have been established in these drainages by the research staff of the University of Idaho in order to study the cause and effect of the blight.

RESISTANT WHITE PINE

A conference of Forest Service and Bureau of Entomology and Plant Quarantine personnel was held at Savenac Nursery in September to consider propagation of white pine resistant to blister rust and to formulate plans for the establishment of an arboretum for resistant white pine. An area in Randolph Creek fulfilling the requirements was selected. A plot of 2.15 acres was cleared and slash wind-rowed by bulldozer in anticipation of planting next spring.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures is shown in the following table.

TABLE 1

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1949 CABINET OPERATION

| Item | Bureau of Entomology and Plant Quarantine | Forest Service | Total |
|----------------------|--|----------------|----------|
| | BLR-1-4 | BLR-4 | |
| Contract ribes erad. | | \$ 1,444 | \$ 1,444 |
| Salary perm. men | \$2,369 | 7,611 | 9,980 |
| Wages temp. labs. | 30 | 64,041 | 64,071 |
| Subs. supplies | | 14,079 | 14,079 |
| Equipment | 46 | 2,309 | 2,355 |
| Travel and transp. | 283 | 412 | 695 |
| Other expenses | 225 | 4,319 | 4,544 |
| Total | \$2,953 | \$94,215 | \$97,168 |

TABLE 2

SUMMARY OF RIBES ERADICATION, 1949
CABINET OPERATION

| Working | Eradication Type | Year of Origin | Acres | Man-Days | Ribes | Per Acre | |
|-------------|------------------|----------------|-------|----------|---------|----------|-------|
| | | | | | | Man-Days | Ribes |
| First | Reproduction (2) | 1910-39 | 1,598 | 2,557 | 131,320 | 1.60 | 82 |
| | Stream (1) | | 42 | 209 | 40,940 | 4.98 | 975 |
| | Total | | 1,640 | 2,766 | 172,260 | 1.69 | 105 |
| Second | Reproduction | 1910-39 | 776 | 829 | 18,580 | 1.07 | 24 |
| Third | Reproduction | 1910-39 | 69 | 102 | 1,540 | 1.48 | 22 |
| GRAND TOTAL | | | 2,485 | 3,697 | 192,380 | 1.49 | 77 |

Chemical work included above:

| Stream | | | | Upland | | | |
|--------|----------|---------|--|--------|----------|---------|--|
| | | Gallons | | | | Gallons | |
| Acres | Man-Days | Spray | | Acres | Man-Days | Spray | |
| (1) 42 | 197 | 3,935 | | (2) 25 | 81 | 1,600 | |

TABLE 3

RIBES SPECIES ERADICATED, 1949
CABINET OPERATION

| Working | Eradication Type | Acres | Ribes Species | | Total Ribes |
|--------------|------------------------|-------|----------------|---------------------|-------------|
| | | | Ribes lacustre | Ribes viscosissimum | |
| First | Reproduction (1910-39) | 1,598 | 69,280 | 62,040 | 131,320 |
| | Stream | 42 | 38,880 | 2,060 | 40,940 |
| | Total | 1,640 | 108,160 | 64,100 | 172,260 |
| Second | Reproduction (1910-39) | 776 | 3,720 | 14,860 | 18,580 |
| Third | Reproduction (1910-39) | 69 | 260 | 1,280 | 1,540 |
| All Workings | Reproduction (1910-39) | 2,443 | 73,260 | 78,180 | 151,440 |
| | Stream | 42 | 38,880 | 2,060 | 40,940 |
| | Total | 2,485 | 112,140 | 80,240 | 192,380 |

TABLE 4

SUMMARY OF RIBES ERADICATION, 1928-1949
CABINET OPERATION

| Working | Eradication Type | Year of Origin | Gross Acres Worked | Man-Days | Ribes | Per Acre | | Net Acreage Remaining | |
|-----------------|------------------|----------------|--------------------|----------|------------|----------|-------|-----------------------|----------|
| | | | | | | Man-Day | Ribes | Worked | Unworked |
| First | Cutover | 1940-1944 | | | | | | | 399 |
| | Reproduction (4) | 1910-1939 | 37,398 | 40,588 | 6,610,930 | 1.09 | 177 | 36,836 | 4,571 |
| | Pole | | 25,959 | 9,213 | 1,745,885 | .35 | 67 | 25,670 | 6,334 |
| | Mature | | 9,377 | 4,457 | 1,064,702 | .48 | 114 | 9,357 | 1,712 |
| | Miscellaneous | | 4,900 | 2,230 | 596,499 | .46 | 122 | 4,650 | |
| | Stream (1) | | 5,116 | 16,375 | 3,694,928 | 3.20 | 722 | 5,116 | |
| Second | Total | | 82,750 | 72,863 | 13,712,944 | .88 | 166 | 81,629 | 13,016 |
| | Reproduction | 1910-1939 | 7,513 | 11,720 | 918,875 | 1.56 | 122 | 7,513 | |
| | Pole | | 1,108 | 1,423 | 101,767 | 1.28 | 92 | 1,108 | |
| | Mature | | 28 | 27 | 1,799 | .96 | 64 | 28 | |
| | Miscellaneous | | 33 | 34 | 1,503 | 1.03 | 46 | 33 | |
| | Stream (2) | | 3,140 | 5,729 | 727,480 | 1.82 | 232 | 3,140 | |
| Third and Other | Total | | 11,822 | 18,933 | 1,751,424 | 1.60 | 148 | 11,822 | |
| | Reproduction | 1910-1939 | 2,208 | 2,636 | 125,741 | 1.19 | 57 | 2,208 | |
| | Pole | | 125 | 149 | 7,256 | 1.19 | 58 | 125 | |
| | Stream (3) | | 3,250 | 3,922 | 193,635 | 1.21 | 60 | 3,250 | |
| | Total | | 5,583 | 6,707 | 326,632 | 1.20 | 59 | 5,583 | |
| GRAND TOTAL | | | 100,155 | 98,503 | 15,791,000 | .98 | 158 | 99,034 | |

Chemical work included above:

| Stream | | | Upland | | |
|---------|----------|---------------|--------|----------|---------------|
| Acres | Man-Days | Gallons Spray | Acres | Man-Days | Gallons Spray |
| (1) 764 | 2,196 | 65,025 | (4) 25 | 81 | 1,600 |
| (2) 250 | 579 | 26,821 | | | |
| (3) 68 | 269 | 4,623 | | | |

TABLE 5

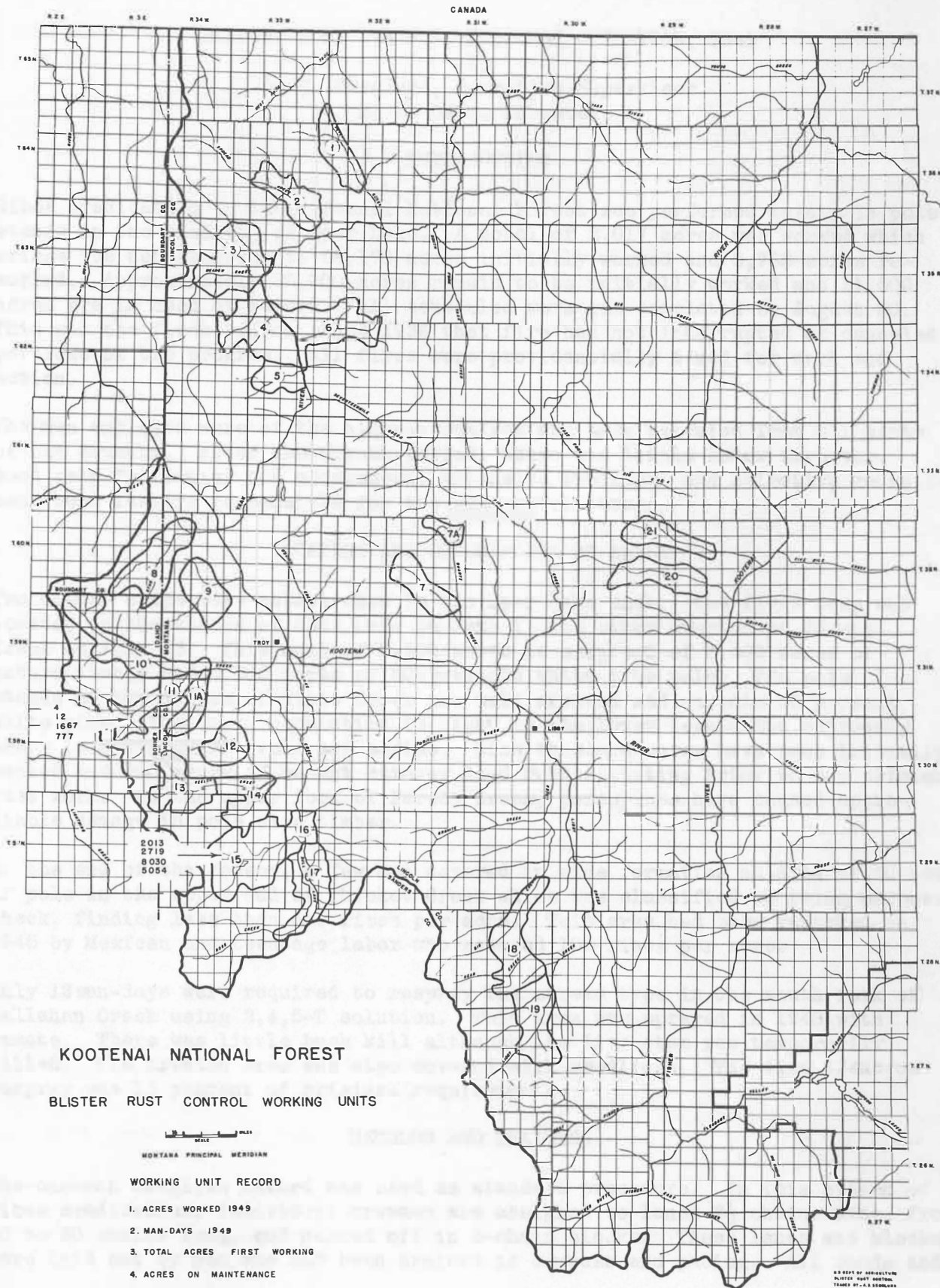
SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1928-1949
CABINET OPERATION

| Class | Gross Acres | Man-Days | Total Ribes | Gallons Spray | Per Acre | |
|--------------|-------------|----------|-------------|---------------|----------|-------|
| | | | | | Man-Days | Ribes |
| EQ-Reg. | 2,002 | 3,295 | 761,710 | 34,795 | 1.65 | 380 |
| EQ-Emergency | 34,321 | 16,293 | 3,840,639 | 1,330 | .47 | 112 |
| FS-Reg. | 29,456 | 42,376 | 3,677,138 | 33,981 | 1.44 | 125 |
| FS-Cont. | 66 | 73 | 4,400 | | 1.11 | 67 |
| FS-Emergency | 31,172 | 30,968 | 6,990,634 | 21,638 | .99 | 224 |
| CCC | 3,138 | 5,498 | 516,479 | 6,325 | 1.75 | 165 |
| Total | 100,155 | 98,503 | 15,791,000 | 98,069 | .98 | 158 |

TABLE 6

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1928-1949
CABINET OPERATION

| Ownership | Net Acres in Control Area | | | | | |
|------------------|---------------------------|--------|-------|--------|----------------|-------------|
| | Acres Worked | | | | Acres Unworked | Total Acres |
| | First | Second | Third | Total | | |
| National Forest | 65,017 | 9,766 | 3,569 | 78,352 | 9,009 | 74,026 |
| Public Domain | 40 | 3 | | 43 | | 40 |
| Subtotal Federal | 65,057 | 9,769 | 3,569 | 78,395 | 9,009 | 74,066 |
| State | 734 | 1 | | 735 | | 734 |
| Private | 15,838 | 2,052 | 2,014 | 19,904 | 4,007 | 19,845 |
| Subtotal Other | 16,572 | 2,053 | 2,014 | 20,639 | 4,007 | 20,579 |
| Total | 81,629 | 11,822 | 5,583 | 99,034 | 13,016 | 94,645 |



BLISTER RUST CONTROL, KOOTENAI OPERATION, 1949

By

A. S. Skoglund, Operation Supervisor

M. D. Oaks, Forester

INTRODUCTION

Ribes eradication in the Kootenai National Forest was performed mainly in pole stands in the vicinity of Spar Lake. A total of 2,017 acres was worked which brings the net progress to 58,179 acres initially worked and 5,768 acres reworked. Approximately 55,000 acres remain to be initially worked and 11,500 acres are in need of rework. All scheduled work was completed by August 30. This was the first season since 1936 that fire had not interrupted or canceled portions of the program. All fires were providentially timed for week end action.

The men employed were of the highest quality and were selected from all parts of the country. After the tryout period, there was little labor turnover. Good camp facilities and management, intensive training, and selective recruitment were factors responsible for the successful season.

LOCATION AND DESCRIPTION OF AREAS

Two 45-man camps were established in the Spar Lake unit. The first camp was located on the shores of Spar Lake on June 1; the other erected on Farway Creek on June 13. This unit of 9,500 acres is composed of 3,400 acres of mature timber and 4,500 acres of 60-year-old white pine pole. The pole stands on the slopes of Hiatt Creek are well stocked and contain 50 percent white pine. The ribes population is light in the lower levels but extremely heavy in the higher levels and basins. Nine thousand acres have been initially worked and 500 acres of recent cutover need rehabilitating prior to any blister rust work. In the upper fork of Farway Creek, porcupines have caused appreciable damage in pole size timber.

At the end of the season, a few men covered in wide formation an area of 50 acres of pole in the upper end of Thicket Creek which was classified as being on post check, finding less than one ribes per acre. This area had been reworked in 1945 by Mexican and teen-age labor who removed 106 ribes per acre.

Only 12 man-days were required to respray the stream type in the south fork of Callahan Creek using 2,4,5-T solution. This area was sprayed in 1948 with Ammate. There was little bush kill although the live stem was temporarily killed. The treated area was also covered with seedlings. The time spent on respray was 16 percent of original requirements.

METHODS AND TRAINING

The one-man dragline method was used as standard procedure. In this system of ribes eradication, individual crewmen are assigned to lanes $2\frac{1}{2}$ chains wide, from 10 to 30 chains long, and marked off in 5-chain blocks. These lanes and blocks were laid out by men who had been trained in compass and pacing. All roads and

trails were traversed and 10-chain stations permanently established to facilitate laying out of areas and their future relocation.

Areas designated as low in ribes on basis of advance check were worked in a wide formation. Three men worked a $2\frac{1}{2}$ chain wide strip guiding on string lines, following one while laying the other. This procedure proved advisable as scattered ribes patches which did not show on check strips were located and removed. These patches were mapped as to location.

In the basins where the ribes were heavy, spraying with 2,4,5-T solutions was used as an auxiliary method to hand pulling of ribes. Whenever water was conveniently available, a knapsack unit was used to apply the spray; otherwise, the Hi-Fog guns were used. The 2,4,5-T concentrate was packed to the spraymen in 4-gallon cans mounted on pack boards. All the chemical work with 2,4,5-T appeared to be effective.

An area of 250 acres on Grizzly fork of Burnt Creek was laid out in four units for contracting. Invitations to bid were advertised in papers and post offices and presented to prospective bidders. Four individuals teamed together and submitted a joint bid of \$25 per acre for the entire area, but the bid was not accepted as it was estimated that the area could be worked by crews for \$17 per acre. This fall another prospective bidder examined the area and signified his intention of submitting a bid for less than \$17 per acre.

A training site was selected on Camp Creek outside of any control unit in order to obtain an area ideally suited to training needs. This area of cutover, pole, and stream types in close proximity contains patches of brush interspersed with Ribes lacustre and R. viscosissimum. Toward the end of the season, additional men were given training in compass and pacing to prepare them for various duties next season.

SAFETY

An intensive safety program employed throughout the season produced results. The only accident was an eye injury sustained by a foreman. This low frequency is commendable because of the rugged terrain in these particular control units. Regularly scheduled 10-minute weekly meetings supplemented intensive training given at the start of the season. The chairmanship of these meetings was delegated to the individual who in the previous week by vote of the entire camp was guilty of the most unsafe act in camp or field. This served to keep the subject of safety on everyone's mind at all times.

CHECKING AND SURVEYS

Four checkers completed a check on all one-man strips. In addition, they spent 10 days on advance survey work in Cherry Creek and 1 week on post check work in Burnt and Cyclone Creeks.

A crew of two men was trained to do stocking and disease survey. They were assisted by four others during the latter part of the season. Nearly all the

survey was confined to 45- to 60-year-old age class of pole, requiring much laborious climbing. Results are summarized in the following analysis.

| Unit | Class | Number Chains | Total Stocking | Percent White Pine Stocking | Percent Damage |
|-------------|---------|------------------|----------------|-----------------------------------|-------------------|
| Spar Lake | 1 & 2 | 466 | Well | 37 | 9 |
| | 3A | 404 | Medium | 17 | 6 |
| Red Top Cr. | 1 & 2 | 240 | Well | 27 | 2 |
| | 3A & 3B | 1,017 | Medium | 7 | 1 |
| Cyclone Cr. | 1 & 2 | 225 | Well | 48 | 0 |
| | 3A & 3B | 754 | Well | 7 | 1 |
| Burnt Cr. | 3B | 447 | Medium | 7 | 3 |

CONTROL STATUS

A total of 33,180 acres is now on maintenance, which represents 57 percent of the worked area. Better work was done by the crews this season than any since the war ended. Over 45 percent of 919 acres were placed on maintenance as a result of this season's work. Eight hundred and thirty-five acres reverted to unworked classification due to logging operations in several of the units.

It is recommended that no blister rust work be performed in the Howard Lake Unit. The stands in this unit are well stocked, but contain only 7 to 20 percent white pine. Five percent of the white pine has been damaged by the rust which has been present since 1941. While the work in the white pine areas would not be very great, the work in the protection zones would be excessive. These areas are precipitous, subject to frequent snow slides, and covered with brush and ribes. Blister rust control would be very costly and difficult due to the combination of long, narrow, and high canyon-like walls surrounding the area.

As shown by an advance survey, ribes eradication in Cherry Creek will involve mainly stream type and stream zones. The better stands of white pine are surrounded by a considerable ribes-free area. As infection is light and confined to streams, it is unlikely that there will be any serious threat from the canyons on the west.

No new areas of pole blight were found in an extensive survey of white pine pole stands. The pole blight was found in Ross Creek and Bull Lake in 1945 and in main Keeler Creek in 1947. The research staff of the University of Idaho has established several plots in the vicinity of Bull Lake to study the disease.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures is shown in the following table.

TABLE 1

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1949 KOOTENAI OPERATION

| Item | Bureau of Entomology and Plant Quarantine | Forest Service | Total |
|--------------------|--|----------------|----------|
| | BLR-1-4 | BLR-4 | |
| Salary perm. men | \$2,369 | \$ 8,368 | \$10,737 |
| Salary temp. men | | 8,206 | 8,206 |
| Wages temp. labs. | 30 | 42,860 | 42,890 |
| Subs. supplies | | 8,786 | 8,786 |
| Equipment | 46 | 6,128 | 6,174 |
| Travel and transp. | 283 | 3,058 | 3,341 |
| Other expenses | 225 | 7,294 | 7,519 |
| Total | \$2,953 | \$84,700 | \$87,653 |

TABLE 2

SUMMARY OF RIBES ERADICATION, 1949
KOOTENAI OPERATION

| Working | Eradication Type | Year of Origin | Acres | Man-Days | Ribes | Per Acre | |
|-------------|------------------|----------------|-------|----------|---------|----------|-------|
| | | | | | | Man-Days | Ribes |
| First | Pole | | 913 | 1,507 | 159,520 | 1.65 | 175 |
| | Mature (2) | | 119 | 400 | 68,790 | 3.36 | 578 |
| | Stream | | 3 | 5 | 360 | 1.67 | 120 |
| | Total | | 1,035 | 1,912 | 228,670 | 1.85 | 221 |
| Second | Reproduction | 1910-39 | 4 | 3 | 30 | .75 | 8 |
| | Pole | | 557 | 388 | 18,180 | .70 | 33 |
| | Mature | | 211 | 189 | 13,440 | .90 | 64 |
| | Stream | | 186 | 215 | 5,400 | 1.16 | 29 |
| | Total | | 958 | 795 | 37,050 | .83 | 39 |
| Third | Stream (1) | | 24 | 24 | 4,790 | 1.00 | 200 |
| GRAND TOTAL | | | 2,017 | 2,731 | 270,510 | 1.35 | 134 |

Chemical work included above:

Stream

Upland

| | | | Gallons | | | | Gallons |
|-------|----------|----|---------|-------|----------|----|---------|
| Acres | Man-Days | | Spray | Acres | Man-Days | | Spray |
| (1) | 4 | 12 | 272 | (2) | 12 | 52 | 206 |

TABLE 3

RIBES SPECIES ERADICATED, 1949
KOOTENAI OPERATION

| Working | Eradication Type | Acres | Ribes Species | | | Total Ribes |
|--------------|------------------------|-------|----------------|---------------------|-------------------|-------------|
| | | | Ribes lacustre | Ribes viscosissimum | Ribes coloradense | |
| First | Pole | 913 | 155,310 | 2,930 | 1,280 | 159,520 |
| | Mature | 119 | 66,910 | 750 | 1,130 | 68,790 |
| | Stream | 3 | 360 | | | 360 |
| | Total | 1,035 | 222,580 | 3,680 | 2,410 | 228,670 |
| Second | Reproduction (1910-39) | 4 | 30 | | | 30 |
| | Pole | 557 | 15,630 | 1,770 | 780 | 18,180 |
| | Mature | 211 | 13,080 | 320 | 40 | 13,440 |
| | Stream | 186 | 4,570 | 750 | 80 | 5,400 |
| | Total | 958 | 33,310 | 2,840 | 900 | 37,050 |
| Third | Stream | 24 | 3,790 | | 1,000 | 4,790 |
| All Workings | Reproduction (1910-39) | 4 | 30 | | | 30 |
| | Pole | 1,470 | 170,940 | 4,700 | 2,060 | 177,700 |
| | Mature | 330 | 79,990 | 1,070 | 1,170 | 82,230 |
| | Stream | 213 | 8,720 | 750 | 1,080 | 10,550 |
| | Total | 2,017 | 259,680 | 6,520 | 4,310 | 270,510 |

TABLE 4

SUMMARY OF RIBES ERADICATION, 1935-1949
KOOTENAI OPERATION

| Working | Eradication Type | Year of Origin | Gross Acres Worked | Man-Days | Ribes | Per Acre | | Net Acreage Remaining | |
|-----------------|------------------|----------------|--------------------|----------|-----------|----------|-------|-----------------------|----------|
| | | | | | | Man-Days | Ribes | Worked | Unworked |
| First | Plantation | 1945-1949 | 244 | 125 | 5,462 | .51 | 22 | 244 | |
| | Cutover | 1945-1949 | | | | | | | 835 |
| | Cutover | 1940-1944 | | | | | | | 5,730 |
| | Cutover | 1920-1939 | 1,274 | 767 | 55,365 | .60 | 43 | 1,274 | 3,651 |
| | Reproduction (4) | 1910-1939 | 13,833 | 9,658 | 1,135,896 | .70 | 82 | 13,074 | 9,682 |
| | Pole | | 24,839 | 12,228 | 1,190,840 | .49 | 48 | 23,787 | 18,953 |
| | Mature (5) | | 17,323 | 4,847 | 678,302 | .28 | 39 | 15,895 | 16,378 |
| | Miscellaneous | | 346 | 95 | 7,956 | .27 | 23 | | 346 |
| | Stream (1) | | 3,954 | 12,472 | 1,681,453 | 3.15 | 425 | 3,559 | |
| | Total | | 61,813 | 40,192 | 4,755,274 | .65 | 77 | 58,179 | 55,229 |
| Second | Plantation | 1945-1949 | 236 | 184 | 2,742 | .78 | 12 | 236 | |
| | Cutover | 1920-1939 | 322 | 262 | 9,803 | .81 | 30 | 322 | |
| | Reproduction | 1910-1939 | 1,441 | 1,306 | 93,562 | .91 | 65 | 1,441 | |
| | Pole | | 2,026 | 1,676 | 77,440 | .83 | 38 | 2,026 | |
| | Mature (6) | | 228 | 204 | 21,030 | .89 | 92 | 228 | |
| | Stream (2) | | 1,564 | 2,938 | 154,975 | 1.88 | 99 | 1,336 | |
| Third and Other | Total | | 5,817 | 6,570 | 359,552 | 1.13 | 62 | 5,589 | |
| | Pole | | 133 | 276 | 10,360 | 2.08 | 78 | | 133 |
| | Stream (3) | | 46 | 38 | 5,528 | .83 | 120 | | 46 |
| | Total | | 179 | 314 | 15,888 | 1.75 | 89 | | 179 |
| GRAND TOTAL | | | 67,809 | 47,076 | 5,130,714 | .69 | 76 | 63,947 | |

Chemical work included above:

| Stream | | | | Upland | | | |
|--------|-------|----------|---------------|--------|-------|----------|---------------|
| | Acres | Man-Days | Gallons Spray | | Acres | Man-Days | Gallons Spray |
| (1) | 149 | 297 | 16,563 | (4) | 10 | 50 | 620 |
| (2) | 15 | 16 | 1,950 | (5) | 12 | 52 | 206 |
| (3) | 4 | 12 | 272 | (6) | 5 | 5 | 750 |

TABLE 5

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1935-1949
KOOTENAI OPERATION

| Class | Gross Acres | Man-Days | Total Ribes | Gallons Spray | Per Acre | |
|--------------|-------------|----------|-------------|---------------|----------|-------|
| | | | | | Man-Days | Ribes |
| EQ-Emergency | 31,755 | 14,494 | 1,934,776 | | .46 | 61 |
| FS-Reg. | 20,177 | 20,988 | 1,863,319 | 20,361 | 1.04 | 92 |
| FS-Emergency | 4,540 | 4,652 | 377,089 | | 1.02 | 83 |
| CCC | 11,337 | 6,942 | 955,530 | | .61 | 84 |
| Total | 67,809 | 47,076 | 5,130,714 | 20,361 | .69 | 76 |

TABLE 6

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1935-1949
KOOTENAI OPERATION

| Ownership | Net Acres in Control Area | | | | | |
|-----------------|---------------------------|--------|-------|----------------|-------------|---------|
| | Acres Worked | | | Acres Unworked | Total Acres | |
| | First | Second | Third | | | Total |
| National Forest | 55,007 | 5,038 | 179 | 60,224 | 44,223 | 99,230 |
| State | | | | | 173 | 173 |
| Private | 3,172 | 551 | | 3,723 | 10,833 | 14,005 |
| Subtotal Other | 3,172 | 551 | | 3,723 | 11,006 | 14,178 |
| Total | 58,179 | 5,589 | 179 | 63,947 | 55,229 | 113,408 |

BLISTER RUST CONTROL, MOUNT RAINIER NATIONAL PARK, 1949

By

J. C. Gynn, Operation Supervisor

C. M. Chapman, Pathologist

The 1949 white pine blister rust control program at Mount Rainier National Park was confined to ribes eradication on cliffs, precipitous slopes, and stream type in the vicinity of the White River campground and adjacent to the Sunrise Park area. The crew consisted of eight men, a superintendent, and a checker. Work started June 13 and ended September 10.

Five hundred forty acres were worked at 1.06 man-days per acre with an average of 84 ribes per acre. Chemical ribes eradication methods were used on 180 acres of stream type and 60 acres of steep slope and cliffs. The hormone chemical 2,4,5-T mixed with emulsifiable oil and water was applied as an aerial spray by use of Hi-Fog guns and manually operated trombone pumps. Emulsifiable oil and water used in place of fuel oil as a carrying and spreading agent reduced chemical costs. Chemical methods have alleviated the broken crown problem and reduced heavy germination of ribes seeds which normally follow soil disturbances resulting from hand grubbing. These two factors will reduce the amount of rework. Inspection of heavy ribes concentrations treated with 2,4,5-T in 1948 showed nearly 100 percent of the ribes dead in 1949. The only bushes surviving were four old large crown multistemmed Ribes watsonianum. These bushes apparently received insufficient chemical as all other R. watsonianum were dead. Other species encountered, including R. laxiflorum, R. acerifolium, R. bracteosum, R. lacustre, and R. viscosissimum, appear highly susceptible to the chemical 2,4,5-T.

Checking and control status. A 4 percent check was made of the entire White River control unit. During the process of checking, a new map was compiled. Using hand compass and pacing methods, all roads and control boundaries were traversed from established control lines and mapped as accurately as possible with other topographical features. Old maps sketched from early small-scale contour maps were not accurate enough for plotting missed ribes or delimiting small maintenance areas from those needing rework. The new survey showed the original area to be 510 acres larger than previously reported. Adjustments are made in the 1949 annual report accumulative tables. The 1949 check on 3,200 acres comprising the White River control unit showed 2,130 acres on maintenance, 100 acres on post check, and 970 acres on rework. Only 410 acres classified as rework are in difficult cliff and precipitous upland bordering Sunrise Park.

Rework areas in the White River unit can be handled best with a small maintenance crew using chemical methods on most of the area.

RECOMMENDATIONS

Longmire-Silver Forest. No ribes eradication or checking work was performed on Longmire-Silver Forest area in 1949. The following program on this unit is recommended for 1950: A complete 3-month period starting about June 12; a crew of eight men, one checker (SP-6), and one superintendent (SP-7). No additional spraying equipment will be needed. Check the entire area except that portion

not worked in 1948. Using the one-man dragline method, complete the area unfinished in 1948. Using 2,4,5-T, spray seedlings in the area known as "Hell's Half Acre" and in stream type. After completing this work, perform the maintenance work as shown by the 1950 check.

White River. No further ribes eradication work until the Longmire-Silver Forest area has been maintained.

RESULTS

The following tables show statements of expenditures, results of the 1949 field work and accumulative results of all work performed to date:

TABLE 1

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1949 MOUNT RAINIER NATIONAL PARK

| Item | National Park Service |
|-----------------------|-----------------------------|
| Personal Services | \$ 9,599.47 |
| Communication Service | 5.52 |
| Contractual Services | 648.72 |
| Supplies & Materials | 309.90 |
| Equipment | 246.90 |
| Checker's Salary | 1,090.44 |
| Total | \$11,900.95 |

TABLE 2

SUMMARY OF RIBES ERADICATION, 1949
MOUNT RAINIER NATIONAL PARK

| Area | Working | Acres | Man-Days | Ribes Species | | | | | | Total Ribes | Gallons Spray 2,4,5-T | Per Acre | |
|-------------|---------|-------|----------|----------------|---------------------|------------------|-------------------|------------------|-------------------|-------------|-----------------------|----------|-------|
| | | | | Ribes lacustre | Ribes viscosissimum | Ribes bracteosum | Ribes watsonianum | Ribes laxiflorum | Ribes acerifolium | | | Man-Days | Ribes |
| White River | Second | 360 | 328 | 14,031 | 6,217 | | 23 | 10 | 10 | 20,291 | 175 | .91 | 56 |
| | Other | 180 | 244 | 8,791 | 1,508 | 71 | 116 | 13,248 | 1,175 | 24,909 | 499 | 1.36 | 138 |
| | Total | 540 | 572 | 22,822 | 7,725 | 71 | 139 | 13,258 | 1,185 | 45,200 | 674 | 1.06 | 84 |

TABLE 3

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1930-1949
MOUNT RAINIER NATIONAL PARK

| Class | Gross Acres | Net Acres | Man-Days | Total Ribes | Gallons Spray | Per Acre | |
|---------|-------------|-----------|----------|-------------|---------------|----------|-------|
| | | | | | | Man-Days | Ribes |
| NP-Reg. | 12,090 | 11,281 | 11,916 | 1,131,388 | 3,374 | .99 | 94 |
| NP-CCC | 10,960 | 6,599 | 12,692 | 1,293,167 | | 1.16 | 118 |
| Total | 23,050 | 17,880 | 24,608 | 2,424,555 | 3,374 | 1.07 | 105 |

TABLE 4

SUMMARY OF RIBES ERADICATION, 1930-1949
MOUNT RAINIER NATIONAL PARK
(NET CONTROL AREA)

| Area | Working | Acres | Man-Days | Ribes Species | | | | | | Total Ribes | Gallons Spray | Per Acre | |
|-------------|---------|--------|----------|----------------|---------------------|------------------|-------------------|------------------|-------------------|-------------|---------------|----------|-------|
| | | | | Ribes lacustre | Ribes viscosissimum | Ribes bracteosum | Ribes watsonianum | Ribes laxiflorum | Ribes acerifolium | | | Man-Days | Ribes |
| Longmire | First | 900 | 1,599 | 225,968 | | 98,875 | | 59,308 | 8,658 | 392,809 | | 1.78 | 436 |
| | Second | 888 | 797 | 30,938 | | 24,332 | | 2,394 | 2,938 | 60,602 | | .90 | 68 |
| | Other | 3,072 | 4,490 | 89,581 | | 19,959 | | 4,051 | 42,637 | 156,228 | 100 | 1.46 | 51 |
| | Total | 4,860 | 6,886 | 346,487 | | 143,166 | | 65,753 | 54,233 | 609,639 | 100 | 1.42 | 125 |
| White River | First | 3,200 | 3,163 | 378,460 | 84,847 | 5,429 | 140,613 | 10,564 | 12,289 | 632,202 | | .99 | 198 |
| | Second | 3,012 | 2,812 | 84,562 | 22,532 | 2,330 | 6,964 | 16,239 | 4,547 | 137,174 | | .93 | 46 |
| | Other | 6,808 | 3,338 | 96,843 | 19,601 | 10,715 | 14,008 | 28,320 | 6,934 | 176,421 | 3,274 | .49 | 26 |
| | Total | 13,020 | 9,313 | 559,865 | 126,980 | 18,474 | 161,585 | 55,123 | 23,770 | 945,797 | 3,274 | .72 | 73 |
| All Areas | First | 4,100 | 4,762 | 604,428 | 84,847 | 104,304 | 140,613 | 69,872 | 20,947 | 1,025,011 | | 1.16 | 250 |
| | Second | 3,900 | 3,609 | 115,500 | 22,532 | 26,662 | 6,964 | 18,633 | 7,485 | 197,776 | | .93 | 51 |
| | Other | 9,880 | 7,828 | 186,424 | 19,601 | 30,674 | 14,008 | 32,371 | 49,571 | 332,649 | 3,374 | .79 | 34 |
| | Total | 17,880 | 16,199 | 906,352 | 126,980 | 161,640 | 161,585 | 120,876 | 78,003 | 1,555,436 | 3,374 | .91 | 87 |

BLISTER RUST CONTROL, GLACIER NATIONAL PARK, 1949

By

J. C. Gynn, Operation Supervisor

C. M. Chapman, Pathologist

Ribes eradication work for the control of white pine blister rust in Glacier National Park during 1949 was carried on in both the East Glacier and Oldman Lake control units as recommended in the 1948 annual report.

Chemical methods were used for the first time in this park to considerable advantage. Savings were made to the extent that 150 acres in the Oldman Lake area, not included in the estimates for 1949, were worked without additional personnel. The hormone chemical 2,4,5-T mixed with emulsifiable oil and water was applied to the ribes selectively, using Hi-Fog guns developing 1,000 pounds pressure and manually operated trombone pumps. The one-man dragline method was used wherever possible when chemical methods were not applicable.

East Glacier. Acres worked, 200; man-days per acre, 1.02. Work started June 13. A superintendent, a checker, and 25 laborers were employed. Intensive training in the use of chemical and one-man dragline methods was carried on while working this area. After checking the 1949 work, it was classified for control status as follows: 113 acres on maintenance and 87 acres on rework. The area classified as rework represents Roes Creek stream type and unstable slopes producing ribes seedlings annually. It is believed the little soil disturbance by the chemical method will help to reduce troublesome ribes seed germination in this control unit. The infection survey conducted in 1948 showed the heaviest pine infection in the northwest part of the protection zone above cliffs bordering the campground. The 1949 working included this entire portion, eliminating possible sporidial showers onto the white pine in the campground area below. The crew was moved to Oldman Lake July 5 as previously planned.

Oldman Lake. Work started July 6 continuing until September 9. Acres worked, 520; man-days per acre, 2.06; ribes removed per acre, 310. The chemical method, with trombone pumps applying low chemical concentrates, was used on all heavy ribes areas where water was readily available. On the inaccessible steep slide and cliff areas, Hi-Fog guns were used for spraying a concentrated solution on ribes intermingled with the prostrate pine and fir. All initial ribes eradication in the unit was completed except for 5 acres on a precipitous slide near the south boundary. Ribes on this spot must be eradicated by chemicals in early summer when water is available near the site from melting snow. Back-packing water from below proved too hazardous. A complete systematic check and control status classification was made for the first time. Definite control boundaries were established and the total acreage computed. A check on the total 1,520 acres in the unit showed 480 acres on maintenance and 1,040 acres on rework. Rework includes a large amount so classified because of heavy original ribes population. It also includes all 1949 chemical work as ribes survival cannot be definitely determined until the year following treatment. The 480 acres on maintenance represent the best white pine stand in the control unit.

Conclusion. Glacier National Park white pine blister rust control program is on schedule as outlined in the 1948 annual report. Destroying ribes with 2,4,5-T has proven successful at substantially reduced costs. A saving of 8 man-days per acre resulted from using the chemical on 46 acres of heavy ribes concentrations in the Oldman Lake area. Savings to a lesser degree were also evident in all other chemically treated areas. Where hand eradication methods are applicable, the one-man dragline system has proven most efficient.

RECOMMENDATIONS

Two Medicine. This is the only area scheduled for ribes eradication in 1950. A small maintenance crew will be needed for a complete 3-month period beginning about June 12, composed of six experienced men and one experienced superintendent (SP-7). The camp superintendent will perform all checking work necessary. Using chemical and one-man dragline methods, necessary rework is to be performed as shown by the 1947 check and control status data.

RESULTS

The following tables show statements of expenditures, results of the 1949 field work and accumulative results of all work performed to date:

TABLE 1

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1949 GLACIER NATIONAL PARK

| Item | National Park Service |
|---------------------------|-----------------------------|
| Personal Services | \$21,699.95 |
| Travel & Transportation | 78.08 |
| Communication Service | 7.30 |
| Other Structural Services | 5,808.21 |
| Supplies & Materials | 453.05 |
| Equipment | 1,595.70 |
| Checker's Salary | 863.77 |
| Total | \$30,506.06 |

TABLE 2

SUMMARY OF RIBES ERADICATION, 1949
GLACIER NATIONAL PARK

| Area | Working | Acres | Man-Days | Ribes Species | | | Total Ribes | Gallons Spray | Per Acre | |
|--------------|---------|-------|----------|----------------|---------------------|---------------|-------------|---------------|----------|-------|
| | | | | Ribes lacustre | Ribes viscosissimum | Ribes setosum | | | Man-Days | Ribes |
| East Glacier | Other | 200 | 272 | 14,364 | 913 | 5,053 | 20,330 | 25 | 1.36 | 102 |
| | First | 370 | 845 | 134,521 | 204 | 2,175 | 136,900 | 3,297 | 2.28 | 370 |
| Oldman Lake | Second | 150 | 224 | 24,370 | | | 24,370 | 152 | 1.49 | 162 |
| | Total | 520 | 1,069 | 158,891 | 204 | 2,175 | 161,270 | 3,449 | 2.06 | 310 |
| All Areas | First | 370 | 845 | 134,521 | 204 | 2,175 | 136,900 | 3,297 | 2.28 | 370 |
| | Second | 150 | 224 | 24,370 | | | 24,370 | 152 | 1.49 | 162 |
| | Other | 200 | 272 | 14,364 | 913 | 5,053 | 20,330 | 25 | 1.36 | 102 |
| | Total | 720 | 1,341 | 173,255 | 1,117 | 7,228 | 181,600 | 3,474 | 1.86 | 252 |

TABLE 3

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1939-1949
GLACIER NATIONAL PARK

| Class | Acres | Man-Days | Total Ribes | Gallons Spray | Per Acre | |
|---------|--------|----------|-------------|---------------|----------|-------|
| | | | | | Man-Days | Ribes |
| NP-Reg. | 5,919 | 7,298 | 721,342 | 3,474 | 1.23 | 122 |
| NP-CCC | 2,633 | 2,833 | 323,841 | | 1.08 | 123 |
| NP-CPS | 2,776 | 2,285 | 214,156 | | .82 | 77 |
| Total | 11,328 | 12,416 | 1,259,339 | 3,474 | 1.10 | 111 |

TABLE 4

SUMMARY OF RIBES ERADICATION, 1939-1949
GLACIER NATIONAL PARK

| Area | Working | Acres | Man-Days | Ribes Species | | | | Total Ribes | Gallons Spray | Per Acre | |
|-------------------|---------|--------|----------|----------------|---------------------|---------------|--------------|-------------|---------------|----------|-------|
| | | | | Ribes lacustre | Ribes viscosissimum | Ribes setosum | Ribes inerme | | | Man-Days | Ribes |
| Park Headquarters | First | 690 | 450 | 32,738 | 43,176 | 32,986 | | 108,900 | | .65 | 158 |
| | Second | 619 | 201 | 3,277 | 2,518 | 1,195 | 2 | 6,992 | | .32 | 11 |
| | Other | 701 | 379 | 6,660 | 5,064 | 3,284 | | 15,008 | | .54 | 21 |
| | Total | 2,010 | 1,030 | 42,675 | 50,758 | 37,465 | 2 | 130,900 | | .51 | 65 |
| Two Medicine | First | 707 | 1,243 | 74,509 | 4,193 | 6,388 | 23,072 | 108,162 | | 1.76 | 153 |
| | Second | 685 | 739 | 84,693 | 2,498 | 4,631 | 33,679 | 125,501 | | 1.08 | 183 |
| | Other | 366 | 340 | 52,188 | 1,501 | | 12,596 | 66,285 | | .93 | 181 |
| | Total | 1,758 | 2,322 | 211,390 | 8,192 | 11,019 | 69,347 | 299,948 | | 1.32 | 171 |
| Lake McDonald | First | 1,777 | 1,201 | 43,036 | 4,289 | 35,777 | | 83,102 | | .68 | 47 |
| | Second | 1,777 | 1,080 | 29,142 | 15,455 | 19,211 | | 63,808 | | .61 | 36 |
| | Other | 1,216 | 849 | 13,121 | 1,126 | 1,843 | | 16,090 | | .70 | 13 |
| | Total | 4,770 | 3,130 | 85,299 | 20,870 | 56,831 | | 163,000 | | .66 | 34 |
| East Glacier | First | 446 | 1,289 | 46,129 | 15,236 | 11,712 | 111,862 | 184,939 | | 2.89 | 415 |
| | Second | 388 | 720 | 37,434 | 5,497 | 30,577 | 2,385 | 75,893 | | 1.86 | 196 |
| | Other | 286 | 446 | 27,737 | 1,491 | 6,686 | 275 | 36,189 | 25 | 1.56 | 127 |
| | Total | 1,120 | 2,455 | 111,300 | 22,224 | 48,975 | 114,522 | 297,021 | 25 | 2.19 | 265 |
| Oldman Lake | First | 1,520 | 3,255 | 341,175 | 306 | 2,619 | | 344,100 | 3,297 | 2.14 | 226 |
| | Second | 150 | 224 | 24,370 | | | | 24,370 | 152 | 1.49 | 162 |
| | Total | 1,670 | 3,479 | 365,545 | 306 | 2,619 | | 368,470 | 3,449 | 2.08 | 221 |
| All Areas | First | 5,140 | 7,438 | 537,587 | 67,200 | 89,482 | 134,934 | 829,203 | 3,297 | 1.45 | 161 |
| | Second | 3,619 | 2,964 | 178,916 | 25,968 | 55,614 | 36,066 | 296,564 | 152 | .82 | 82 |
| | Other | 2,569 | 2,014 | 99,706 | 9,182 | 11,813 | 12,871 | 133,572 | 25 | .78 | 52 |
| | Total | 11,328 | 12,416 | 816,209 | 102,350 | 156,909 | 183,871 | 1,259,339 | 3,474 | 1.10 | 111 |



W 603

Oldman Lake unit: West end of white pine blister rust control area. Boundary on continental divide in background. Blister rust camp lower left portion of picture.



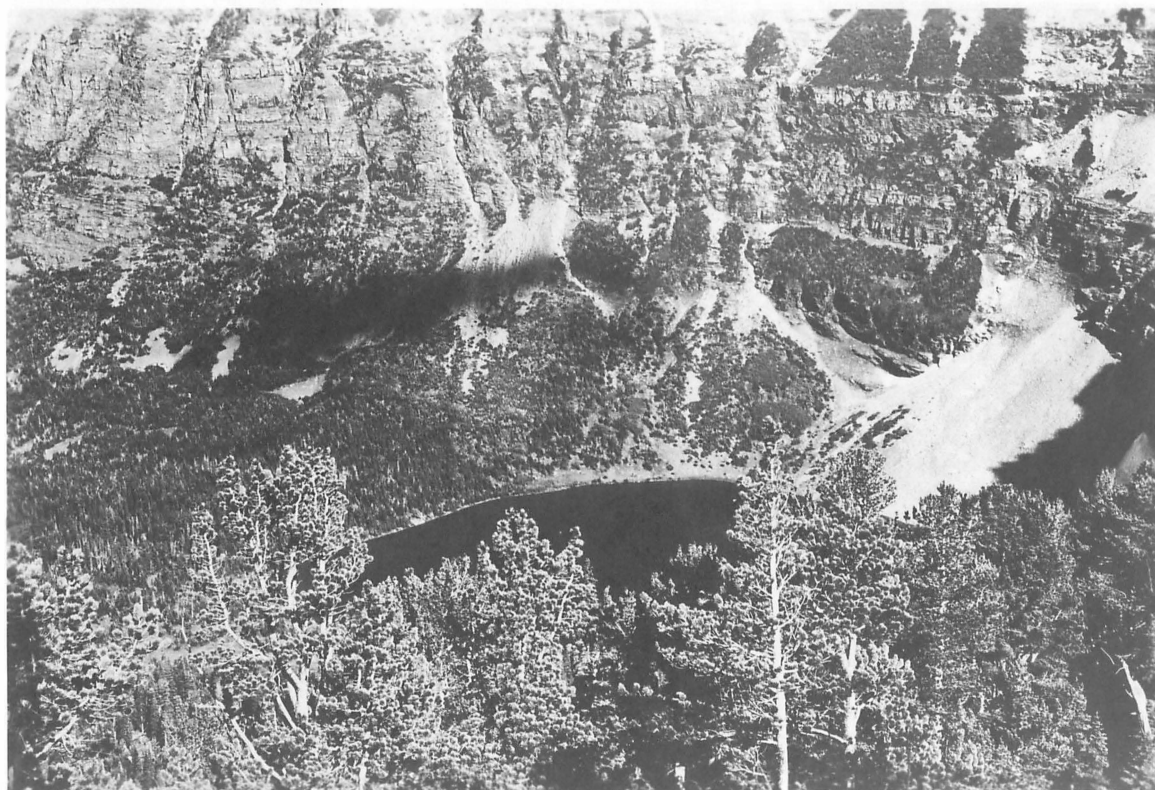
W 589

Oldman Lake unit: Mt. Morgan and Cut Bank Pass with cliff areas worked in 1948. The prostrate pine growths appearing on the cliff ledges contain heavy ribes concentrations.



W 600

Oldman Lake unit: Main portion of area showing excellent stand of Pinus Albicaulis (white bark pine). Outlet of Oldman Lake at right. Lower or Boy Lake just visible in center background.



W 607

Oldman Lake unit: Lower or Boy Lake with cliff and precipitous areas in background. Worked in 1949 using hand and chemical methods (Hi-Fog guns). Patches of prostrate growth of white bark pine contain heavy ribes concentrations. White bark pine tops in foreground.



W 608

Oldman Lake unit: Mature Pinus Albicaulis (white bark pine) representing the stand composition of main pine area shown in picture W 600.



W 624

Hi-Fog Gun spraying: Used extensively on Oldman Lake unit to treat ribes on precipitous slopes and cliffs during 1949.

BLISTER RUST CONTROL, YELLOWSTONE NATIONAL PARK, 1949

By

J. C. Gynn, Operation Supervisor

C. M. Chapman, Pathologist

The 1949 blister rust control program in Yellowstone National Park was confined to ribes eradication and checking in the Mount Washburn area. Nineteen hundred acres were worked with an average of 1.02 man-days per acre and 214 ribes per acre. Work started June 13 and continued until September 10. The crew averaged 35 men, 1 experienced superintendent, and 1 experienced checker.

Chemical methods of ribes eradication were used on all stream type and heavy ribes concentrations in the upland at a greatly reduced cost. The hormone chemical 2,4,5-T was in adequate supply for the 1949 program, and for the first time a practical chemical was available that would kill all species of ribes encountered in the park. Two means of applying chemical were employed. Stream type ribes were sprayed with a dilute solution of 2,4,5-T using knapsack units with manually-operated trombone pumps. The same chemical in a more concentrated solution was applied to upland *Ribes montigenum* clumps with Hi-Fog guns. By using Hi-Fog guns in combination with the one-man dragline method in the upland, production was increased 40 percent over previous years. This represents an average saving of six-tenths of a man-day for every acre worked in 1949. Effectiveness of the one-man dragline method in finding the ribes where they are more scattered made it possible to place a large part of the area worked in 1949 on maintenance. All 1949 objectives would have been accomplished except for time lost to fire suppression.

CHECKING AND CONTROL STATUS

After a complete systematic check, the 1949 work area was classified as follows: Maintenance, 735 acres; post check, 142 acres; rework, 1,023 acres. Rework includes all sprayed areas, as ribes survival cannot be determined until the year following treatment.

A post check on 218 acres worked in 1947 showed 188 acres to be on maintenance and 130 acres in the rework category.

The 4,700 acres comprising the Mount Washburn unit are now classified for control status as follows: Maintenance, 1,190 acres; post check, 1,311 acres; rework, 1,799 acres; unworked, 400 acres. Much of the area classified for rework and post check can be brought to maintenance standards at a minimum cost.

BLISTER RUST INFECTION

Blister rust infection was found on white pine in the Sunlight Creek drainage just 2 miles north of the Yellowstone National Park boundary in 1949. This is approximately 200 miles nearer the park than any previously known pine infection center. The disease was not found on white pine in the park. Blister rust infection on ribes was found for the first time on Stevens Creek near Park Headquarters and on Elk Creek near Tower Falls ranger station. Ribes and white pine were examined for the rust in 22 other park drainages with negative results.

RECOMMENDATIONS

The 1949 ribes eradication program was interrupted at its peak of production. Controlling many fires occurring in the park required the assistance of all blister rust workers. Approximately 500 man-days were lost by the blister rust project during this period. For this reason, the rework and 400 acres of initial work planned for 1949 were not completed. The following 1950 estimate is made accordingly to complete initial and necessary rework as scheduled in 1948:

For a complete 3-month period starting approximately June 12, a crew of 25 men, 1 superintendent (SP-7) and 1 checker (SP-6). Work plan: (1) Using chemical and dragline methods, complete the 400 acres of initial work remaining; check 1949 chemical work; (2) check all areas classified prior to 1949 as on post check; (3) perform all rework as indicated by the latest checking and control status data.

RESULTS

The following tables show statements of expenditures, results of the 1949 field work and accumulative results of all work performed to date:

TABLE 1

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1949 YELLOWSTONE NATIONAL PARK

| Item | National Park Service |
|-------------------------|-----------------------------|
| Personal Services | \$28,325.94 |
| Travel & Transportation | 5.80 |
| Communication Service | 8.16 |
| Contractual Services | 1,288.59 |
| Supplies & Materials | 2,217.87 |
| Equipment | 986.30 |
| Checker's Salary | 995.34 |
| Total | \$33,828.00 |

TABLE 2

SUMMARY OF RIBES ERADICATION, 1949
YELLOWSTONE NATIONAL PARK

| Area | Working | Acres | Man-Days | Ribes Species | | | | | Total Ribes | Gallons Spray | Per Acre | |
|----------------|---------|-------|----------|----------------|---------------------|-----------------|--------------|------------------|-------------|---------------|----------|-------|
| | | | | Ribes lacustre | Ribes viscosissimum | Ribes petiolare | Ribes inerme | Ribes montigenum | | | Man-Days | Ribes |
| Mount Washburn | First | 1,820 | 1,900 | 242,502 | 17,117 | 1,411 | 32,306 | 111,664 | 405,000 | 6,313 | 1.04 | 223 |
| | Second | 80 | 39 | 913 | 17 | | | 70 | 1,000 | | .49 | 13 |
| | Total | 1,900 | 1,939 | 243,415 | 17,134 | 1,411 | 32,306 | 111,734 | 406,000 | 6,313 | 1.02 | 214 |

TABLE 3

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1945-1949
YELLOWSTONE NATIONAL PARK

| Class | Acres | Man-Days | Total Ribes | Gallons Spray | Per Acre | |
|---------|--------|----------|-------------|---------------|----------|-------|
| | | | | | Man-Days | Ribes |
| NP-Reg. | 9,343 | 7,374 | 1,055,817 | 11,140 | .79 | 113 |
| NP-CPS | 1,567 | 992 | 95,769 | 765 | .63 | 61 |
| Total | 10,910 | 8,366 | 1,151,586 | 11,905 | .77 | 106 |

TABLE 4

SUMMARY OF RIBES ERADICATION, 1945-1949
YELLOWSTONE NATIONAL PARK

| Area | Working | Acres | Man-Days | Ribes Species | | | | | | | Total Ribes | Gallons Spray | Per Acre | |
|----------------|---------|--------|----------|----------------|---------------------|-----------------|--------------|---------------|--------------|------------------|-------------|---------------|----------|-------|
| | | | | Ribes lacustre | Ribes viscosissimum | Ribes petiolare | Ribes inerme | Ribes setosum | Ribes cereum | Ribes montigenum | | | Man-Days | Ribes |
| Mammoth | First | 1,580 | 1,040 | 8,322 | 2,331 | 19,190 | | 63,001 | 12,215 | | 105,059 | 1,646 | .66 | 66 |
| | Second | 1,478 | 563 | 6,286 | 1,727 | 8,002 | | 55,042 | 4,083 | | 75,140 | 736 | .38 | 51 |
| | Other | 152 | 204 | | 417 | 4,090 | | 12,880 | 1,567 | | 18,954 | 409 | 1.34 | 125 |
| | Total | 3,210 | 1,807 | 14,608 | 4,475 | 31,282 | | 130,923 | 17,865 | | 199,153 | 2,791 | .56 | 62 |
| Mount Washburn | First | 4,300 | 6,128 | 371,494 | 20,998 | 21,337 | 32,687 | | | 482,434 | 928,950 | 9,114 | 1.43 | 216 |
| | Second | 80 | 39 | 913 | 17 | | | | | 70 | 1,000 | | .49 | 13 |
| | Total | 4,380 | 6,167 | 372,407 | 21,015 | 21,337 | 32,687 | | | 482,504 | 929,950 | 9,114 | 1.41 | 212 |
| Craig Pass | First | 3,320 | 392 | 7,599 | 2,962 | | 2,340 | | | 9,582 | 22,483 | | .12 | 7 |
| All Areas | First | 9,200 | 7,560 | 387,415 | 26,291 | 40,527 | 35,027 | 63,001 | 12,215 | 492,016 | 1,056,492 | 10,760 | .82 | 115 |
| | Second | 1,558 | 602 | 7,199 | 1,744 | 8,002 | | 55,042 | 4,083 | 70 | 76,140 | 736 | .39 | 49 |
| | Other | 152 | 204 | | 417 | 4,090 | | 12,880 | 1,567 | | 18,954 | 409 | 1.34 | 125 |
| | Total | 10,910 | 8,366 | 394,614 | 28,452 | 52,619 | 35,027 | 130,923 | 17,865 | 492,086 | 1,151,586 | 11,905 | .77 | 106 |

BLISTER RUST CONTROL, ROCKY MOUNTAIN NATIONAL PARK, 1949

By

J. C. Gynn, Operation Supervisor

C. M. Chapman, Pathologist

The 16 chemical ribes eradication plots established in Rocky Mountain National Park during 1948 were inspected in June and July 1949 with the following results: The species Ribes montigenum, R. coloradense, R. lacustre, and R. setosum proved highly susceptible to the hormone chemical 2,4,5-T. Resprouting from the crown was occurring on approximately one-half of the large multistemmed R. cereum. All other ribes appeared dead at time of inspection. It is believed insufficient chemical was applied to the crown area of the surviving ribes.

Since making the tests, recent improvements in spraying equipment and application techniques insure an adequate application of chemical to the ribes crowns. This will alleviate the obstacle encountered on the large crowned bushes.

RECOMMENDATIONS

The chemical and one-man dragline methods first used in this region in 1948 and 1949 are particularly well suited for ribes eradication work on nearly all of the Longs Peak-Estes Cone control unit. These methods should be employed to obtain the protection desired for the lowest possible cost.

Work should be started at the south boundary of the control unit in the vicinity of Longs Peak campground progressing north in a contiguous block.

The following estimate is made for 1950 for the proposed Rocky Mountain National Park blister rust control program: For a complete 3-month period on a 6-day week basis beginning approximately June 12, a crew of 35 men, 1 foreman (SP-6), 1 checker (SP-6), and 1 superintendent (SP-7).

To assure obtaining the total estimated effective man-days possible during the working period, it is recommended five additional laborers be hired at the start to take care of time lost from rain, fire, crew reductions, and other unforeseen circumstances.

If the above program is carried out, initial ribes eradication should be completed on the 2,700 acres comprising the south half of the control unit in 1950. This is the highly used area south of the Estes Cone-Battle Mountain ridge.

SPREAD OF WHITE PINE BLISTER RUST

Scouting in Montana, Wyoming, and Idaho, 1949

By J. C. Gynn and C. M. Chapman

Extensive scouting for white pine blister rust was done in nine National Forests, two National Parks, and one Indian Reservation. Infected white pine were located for the first time in three Montana counties. The infection was in the juvenile and pycnial stages on small *Pinus flexilis* or *P. albicaulis*. Associated ribes that probably carried the rust to the pine are *Ribes petiolare* in Park and Madison Counties and *R. viscosissimum* in Lewis and Clark County. The locations are as follows:

1. Park County, Sunlight Creek, Gallatin National Forest, Montana; 2 miles north of Yellowstone National Park.
2. Madison County, Trail Fork of Bear Creek, Gallatin National Forest, Montana; 19 miles northwest of Yellowstone National Park. Ribes infection was found in this drainage in 1937.
3. Lewis and Clark County, McDonald Pass on the Continental Divide, Helena National Forest, Montana; 17 miles west of Helena, Montana.

Infected *R. petiolare* were found for the first time in 10 additional drainages and in 3 additional counties, Lemhi County, Idaho, and Park County and Freemont County, Wyoming. The locations are as follows:

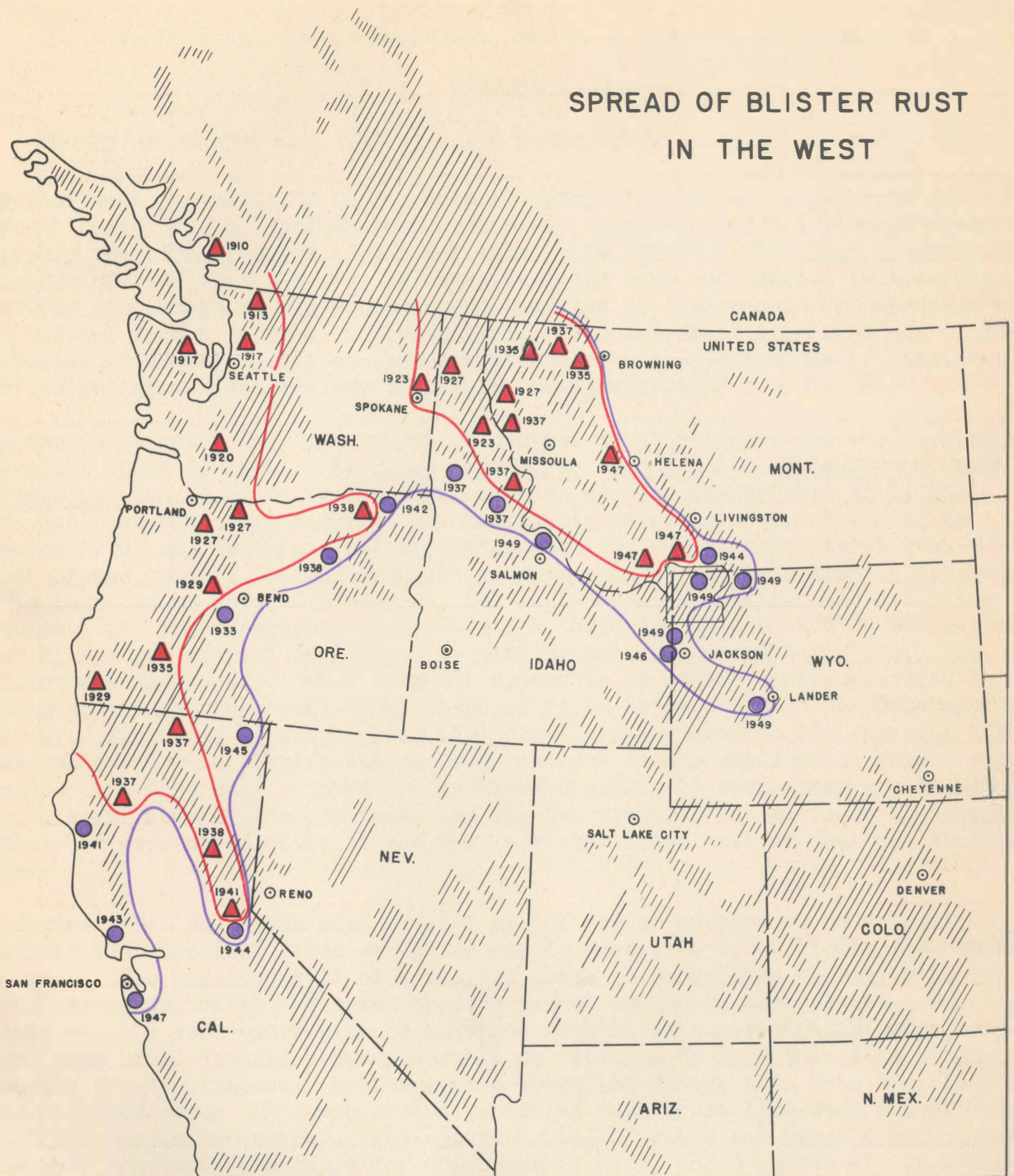
1. Lemhi County, Salmon River, Salmon National Forest, Idaho; between Salmon, Idaho, and Hamilton, Montana.
2. Park County, Muddy Creek, Shoshone National Forest, Wyoming; 12 miles east of Yellowstone National Park and 38 miles east of previously found infection inside the National Park boundary.
3. Freemont County, Popo Aggie River, Washakie National Forest, Wyoming; 12 miles west of Lander, Wyoming. This center is 50 miles south and 100 miles east of the nearest known infection which was found in 1946 near Jackson, Wyoming.
4. Teton County, Darby Creek, Targhee National Forest, Wyoming; 6 miles west of Grand Teton National Park. Infection in this county was first found in 1946.
5. The six additional drainages in which ribes infection was found for the first time are adjacent to previously reported blister rust infection in the Gallatin National Forest, Deerlodge National Forest, and Yellowstone National Park.

SCOUTING SUMMARY, 1949

MONTANA, WYOMING, IDAHO

| Forest Unit | Drainages Sampled | Ribes Examined | Pine Examined | New Ribes Infection Centers | New Pine Infection Centers |
|--------------------------|----------------------|-------------------|------------------|-----------------------------------|----------------------------------|
| Yellowstone NP, Wyo. | 24 | 1,332 | 12,885 | 2 | |
| Shoshone NF, Wyo. | 9 | 236 | 135 | 1 | |
| Washakie NF, Wyo. | 3 | 310 | 125 | 1 | |
| Wind River IR, Wyo. | 1 | 81 | 17 | | |
| Teton NF, Wyo. | 4 | 507 | 123 | | |
| Grand Teton NP, Wyo. | 4 | 490 | 330 | | |
| Targhee NF, Wyo. & Idaho | 2 | 775 | 52 | 1 | |
| Salmon NF, Idaho | 1 | 20 | 15 | 1 | |
| Gallatin NF, Mont. | 10 | 357 | 1,288 | 2 | 2 |
| Bitterroot NF, Mont. | 1 | 30 | 10 | | |
| Deerlodge NF, Mont. | 2 | 40 | | 2 | |
| Helena NF, Mont. | 1 | 36 | 4 | | 1 |
| Total | 62 | 4,214 | 14,984 | 10 | 3 |

SPREAD OF BLISTER RUST IN THE WEST



LEGEND

- ▲ (1910) PINE INFECTION AND YEAR OF ORIGIN
- (1949) RIBES INFECTION AND YEAR FOUND
- BOUNDARY OF INFECTION ON PINE
- BOUNDARY OF INFECTION ON RIBES
- //// WHITE PINE
- STATE LINES

DEVELOPMENTAL WORK IN METHODS OF RIBES ERADICATION, AND PROGRESS OF RIBES
ECOLOGY AND DISEASE CONTROL STUDIES IN THE NORTHWESTERN REGION FOR 1949

By

V. D. Moss, Forest Ecologist, and H. R. Offord, Pathologist

SECTION 1

SUMMARY OF PROJECT WORK FOR 1949 AND RECOMMENDATIONS FOR USE OF CHEMICALS

Project work included (1) first tests in spraying ribes and brush with 2,4,5-T by helicopter in the Northwestern Region, (2) establishing a series of tests to compare the effectiveness of 2,4,5-T spray with "Brush Killer 32," a commercial mixture of 2,4,5-T and 2,4-D, (3) investigating some antibiotics in treating blister rust cankers, (4) establishing a series of dosage and concentration tests of 2,4,5-T with a Buffalo turbine blower, (5) devoting as much time and study as possible in assisting the control operations with chemical spray methods, and (6) maintaining ribes ecology and timber management studies.

In the development and improvement of control methods, these are the results of chemical tests in 1948: (1) Ribes laxiflorum, acerifolium, watsonianum, and bracteosum can be added to the list of ribes species susceptible to 2,4,5-T; (2) the most effective chemical formulation is an ester of 2,4,5-T plus an agricultural oil emulsion; (3) effective results from spraying still require that crowns, stems, leaves, and growing stem tips of mature bushes be treated; seedlings can be sprayed broadcast; (4) minimum concentration of 2,4,5-T for knapsack and power spraying is 2,000 p.p.m. acid equivalent, and 20,000 p.p.m. for Hi-Fog gun or mist spraying; (5) with dosages recommended for field use, ultimate toxicity of 2,4,5-T does not appear to be significantly modified by seasonal changes in growth development of ribes between May 15 and September 1, nor by differences in site during the normal growing season; (6) the year after treatment ribes in significant numbers continue to die until about July 1 regardless of the date when sprayed the previous season; (7) respraying should not commence until July at the earliest; and (8) for treating cut surfaces of decapitated ribes a 5 percent solution of 2,4,5-T in either Diesel oil or fuel oil should be used.

Spraying ribes and brush with 2,4,5-T by helicopter appears to be a feasible method of eradicating ribes seedlings and in preparing brush fields for broadcast burning. The apparent kill of ribes and brush is correlated closely with the density and uniformity of spray deposit as determined by test plates. Two treatments about a year apart will be required to kill ribes originally under more than 4/10 brush density. Spray deposit on ribes under less than 4/10 brush density was significantly better with a 10-gallon dosage than with 5 gallons of solution per acre. In dense growth, about as much brush live stem was killed with one dosage as another. The apparent kill of ribes and brush 3 months after spraying appeared comparable for the rates of 1, 2, and 3 pounds of 2,4,5-T acid per acre. There was no advantage of Diesel oil over the water-emulsifiable oil formulation of 2,4,5-T. The latter was less damaging to conifers.

The need for some type of power rig to spray broadcast at low cost the heavy populations of ribes along roads and skid trails comes closest to being filled

by the turbine blower. A series of dosage and concentration tests of 2,4,5-T applied by blower were made in the Clearwater and St. Joe forests. Project work with the turbine blower was in cooperation with the control operations. Single run spray applications were compared with double runs from opposite directions. The results this fall indicated that ribes could be satisfactorily killed along roads for a distance close to 1 chain in width. Where brush growth is dense, it will probably require two or more applications about a year apart to kill ribes.

Two chemicals were tested as possible antibiotics for killing or retarding white pine blister rust cankers. One is known as "actidione," and the other, the zinc salt of 2,4,5-trichlorophenol. These were applied in low concentrations of aqueous spray. These fungicides were combined with various penetrants and spreaders. An inspection in October showed a heavy casting of needles 2 years and older, and in some instances, the retardation of pycniaspore production.

Project work in ribes ecology and western white pine management was about the same as in 1948. This included the maintenance of field plots and cooperating with Federal, State, and private forest interest in the study of slash disposal measures and cutting practices. More data were accumulated to show the extent and rapidity with which ribes seeds are devitalized after logging and fire have altered the storage environment of the forest floor. A preliminary survey was made of the Bear Paw timber sale area preparatory to establishing a series of ribes regeneration studies in 1950. This will afford an opportunity to study ribes regeneration after both a first and second cutting in an immature stand of timber.

RECOMMENDATIONS FOR THE USE OF CHEMICALS IN RIBES ERADICATION

These instructions are based on data available through the 1949 field season. They supplement and in a few instances modify slightly the previous recommendations on the use of chemicals given in annual reports and in memoranda on eradication methods. Further instructions may be given early in June of 1950 after examining the 1949 tests if anything of importance develops. Details in the use of the turbine blower for spraying along roadways and skid trails will be written up after checking the results of tests in 1949.

I. Chemical

For all ribes species, use the isopropyl ester of 2,4,5-T (40 percent or more, water and oil miscible solution). Other 2,4,5-T esters or mixtures of 2,4,5-T esters can be used with equal effectiveness on ribes when fluid ounces of stock proprietary material are adjusted for the amount of acid equivalent of 2,4,5-T.

Volume of stock proprietary material needed, based on 3-1/3 lbs. of acid per gallon of the isopropyl ester of 2,4,5-T, to mix 10 gallons of spray solution at recommended strengths is as follows:

| <u>P.P.M.</u> | Fluid Ounces of Stock 2,4,5-T for 10 gal. of Spray |
|---------------|---|
| 2,000 | 7.6 |
| 2,500 | 9.5 |
| 3,000 | 11.4 |

II. Types of Treatments

1. Initial Spray

- a. Dilute aqueous spray of 2,4,5-T applied with conventional sprayers; use 2,000 p.p.m. acid equivalent for seedlings, and 2,500 p.p.m. acid equivalent for mature ribes to August 1; thereafter, raise concentration to 3,000 p.p.m. acid equivalent. Add 1 percent agricultural spray oil emulsion (flowable) to aqueous ester formulations.
- b. Concentrates in water or oil applied with Hi-Fog gun or other low volume sprayers; use 5 percent by volume of the stock solution (about 20,000 p.p.m. acid equivalent) with water or oil (Diesel or fuel) as a diluent until August 15; thereafter, use 10 percent (about 40,000 p.p.m. acid equivalent) 2,4,5-T in oil. Add 5 percent oil emulsion to the water formulations.

2. Respray

- a. Dilute aqueous spray applied with conventional sprayers. During entire season use 3,000 p.p.m. adding 1 percent agricultural spray oil emulsion.
- b. Concentrates in water or oil applied with Hi-Fog gun or other low volume sprayers; same as for initial spraying.

3. Decapitation

Use a 5 percent solution of the ester in Diesel or fuel oil. Carry the concentrate in a small oil can or similar dispenser of metal. Don't allow the use of glass containers because, if accidentally broken, a serious injury might result.

III. How to Treat

1. Spraying

Wet ground about root centers with dilute aqueous spray to insure coverage of all adventitious buds and crown tissue, especially on large old bushes. A concentrate should be directly applied on root center. Kick away debris and scarify cambium tissue of large crown centers before applying spray. Where a mantle of organic material covers roots of layering ribes, lift mat of stems and shake free of debris before spraying. Cover thoroughly all stems, leaves, and growing stem tips with chemical solution.

In broadcast spraying, direct stream at an angle of less than 45° from ground surface toward ribes site or ribes clump so solution will reach stems and root crowns. Finish by applying spray downward over top of ribes clump or site.

2. Decapitation

Always cut through crown, or cut all canes as close to it as possible. Apply enough liquid concentrate to wet all cut surface of crown or canes, using enough solution to give a generous run-off onto crown where it is necessary to treat short stubs of canes. Wet all adventitious buds and exposed crown tissue.

IV. When to Treat

1. Initial Spray

Wait until more than three-fourths of flowers on racemes are in bloom, leaves on 1-year-old wood or older mostly expanded, and current stem growth more than half extended regardless of age class or size of bushes. Start spraying where growth is most advanced due to warm site or low elevation. Continue to spray until September 1, but get most of the work done in June and July while ribes are actively growing.

2. Respray

Wait until after July 1 for spraying the year following initial treatment, and preferably until an inspection shows all sprouts have appeared and are large enough to be easily found. If reworking the area is not too pressing a problem, defer respraying until the second season, then follow the spray schedule given for initial work.

3. Decapitation

Ribes may be treated by this method any time during the field season.

SECTION 2

IMPROVEMENT OF CHEMICAL METHODS FOR RIBES ERADICATION RESULTS OF NEW HERBICIDES TESTED IN 1948

Object of chemical tests in 1948 was to determine (1) whether the effectiveness of 2,4,5-T varied with seasonal changes in the growth development of ribes, (2) the comparative results in applying a 2,4,5-T concentrate in a low volume dosage as against a spray of low concentration applied in large volume, (3) whether any part of the required amount of 2,4,5-T could be replaced by the cheaper material 2,4-D in a combination spray, and (4) the most suitable type of diluent and spreader material for both high volume and low dosage spraying.

The results of applying aqueous solutions of 2,4,5-T with various spreader materials by the knapsack sprayer are given in table 1. Treatments of R. lacustre and R. viscosissimum began in June and were replicated through the season until September. All plots were of the same size, 1 milacre or 1/1000 of an acre. The dosage rate was 1 gallon per milacre plot. Conclusions from these tests are (1) 2,000 p.p.m. of 2,4,5-T is considered the minimum concentration for practical application, (2) an oil emulsion should be added as a spreader material to the aqueous solution of 2,4,5-T, and (3) comparable results in applying 2,4,5-T can be obtained throughout the growing season between the dates June 1 and September 1.

On August 1, the concentration of 2,4,5-T should be raised to a precautionary measure against undertreatment at the time bushes prepare for winter dormancy. From June 1 to August 1, the concentration of 2,4,5-T can be lowered to 2,000 p.p.m. for seedlings and 2,500 p.p.m. for bushes of both ribes species.

TABLE 1

RESULTS OF 1948 CHEMICAL TESTS OF AQUEOUS 2,4,5-T SOLUTION APPLIED WITH THE KNAPSACK SPRAYER

| Plot Nos. | Date Sprayed | Ribes Species | Spreader | Parts Per Million | | | | | | |
|-----------|--------------|-------------------------|--------------|--------------------------------------|-----------|----------|-----------|----------|-----------|---------|
| | | | | 500 | 1,000 | 1,500 | 2,000 | 3,000 | 4,000 | 5,000 |
| | | | | (No. Bushes) - Percent Bushes Killed | | | | | | |
| 1-3 | 6/2 | <u>R. viscosissimum</u> | Tergitol | (19) 79.0 | (22) 100 | | (21) 100 | | | |
| 10-13 | 6/15 | | Tergitol | (42) 97.7 | (21) 95.2 | (15) 100 | (41) 100 | | | |
| 36-39 | 6/29 | | Tergitol | (37) 100 | (42) 100 | (45) 100 | (83) 100 | | | |
| 57-60 | 7/21 | | none | | (12) 100 | | (19) 100 | (16) 100 | (5) 100 | |
| 61-64 | 7/21 | | oil emulsion | | (9) 100 | | (14) 100 | (5) 100 | (22) 100 | |
| 74-77 | 7/22 | | none | | (21) 100 | | (29) 100 | (14) 100 | (13) 100 | |
| 97-100 | 7/31 | | none | | (26) 77.0 | | (28) 100 | (19) 100 | (21) 100 | |
| 101-104 | 7/31 | | oil emulsion | | (47) 100 | | (61) 100 | (54) 100 | (44) 100 | |
| 119-122 | 8/16 | | Tergitol | | (18) 88.9 | | (17) 100 | (15) 100 | (23) 100 | |
| 123-126 | 8/16 | | oil emulsion | | (17) 100 | | (15) 100 | (9) 100 | (11) 100 | |
| 127-130 | 8/16 | | Tergitol | | (9) 77.8 | | (23) 100 | (19) 100 | (20) 100 | |
| 160-163 | 9/1 | | Tergitol | | (19) 57.9 | | (31) 83.8 | (21) 100 | (27) 100 | |
| 164-167 | 9/1 | | oil emulsion | | (52) 69.2 | | (25) 96.0 | (34) 100 | (43) 97.7 | |
| 4-9 | 6/3 | <u>R. lacustre</u> | Tergitol | (8) 87.5 | (5) 100 | | (4) 100 | (11) 100 | (5) 100 | (7) 100 |
| 15-18 | 6/17 | | Tergitol | (4) 100 | (3) 100 | (4) 100 | (5) 100 | | | |
| 32-35 | 6/28 | | Tergitol | (7) 85.7 | (7) 100 | (6) 100 | (11) 100 | | | |
| 57-60 | 7/21 | | none | | (16) 56.3 | | (8) 100 | (6) 100 | (7) 100 | |
| 61-64 | 7/21 | | oil emulsion | | (13) 53.8 | | (10) 80.0 | (4) 100 | (7) 100 | |
| 74-77 | 7/22 | | none | | (15) 66.7 | | (6) 100 | (11) 100 | (17) 100 | |
| 78-81 | 7/30 | | none | | (5) 100 | | (5) 100 | (6) 100 | (5) 100 | |
| 82-85 | 7/30 | | oil emulsion | | (5) 100 | | (6) 100 | (4) 100 | (6) 100 | |
| 119-122 | 8/16 | | Tergitol | | (21) 66.7 | | (11) 100 | (16) 100 | (9) 100 | |
| 123-126 | 8/16 | | oil emulsion | | (13) 100 | | (16) 100 | (7) 100 | (9) 100 | |
| 127-130 | 8/16 | | Tergitol | | (6) 66.7 | | (1) 100 | (4) 100 | (3) 100 | |
| 141-144 | 8/31 | | Tergitol | | (7) 14.3 | | (5) 60.0 | (5) 80.0 | (8) 62.5 | |
| 145-148 | 8/31 | | oil emulsion | | (4) 100 | | (6) 100 | (7) 100 | (6) 100 | |
| 139-140 | 8/19 | <u>R. inerme</u> | oil emulsion | | | | (40) 95.0 | | (40) 97.5 | |

TABLE 2

RESULTS OF COMBINATION TESTS OF 2,4,5-T AND 2,4-D
AQUEOUS SPRAY APPLIED WITH THE KNAPSACK SPRAYER

| Date Sprayed | PPM= $\begin{matrix} 2,4,5-T \\ 2,4-D \end{matrix}$ (No. Bushes) Percent Bush Kill | | | | | | | | | |
|----------------------------|--|-----------|----------|----------|-----------|-----------|-----------|----------|----------|----------|
| | 500 | 500 | 500 | 500 | 1000 | 1000 | 1000 | 1000 | 1000 | 2000 |
| | 500 | 1000 | 3000 | 5000 | 500 | 1000 | 2000 | 3000 | 5000 | 1000 |
| <u>Ribes viscosissimum</u> | | | | | | | | | | |
| 6/15 | | (43) 90.6 | | | | | | | | |
| 6/29 | | (36) 97.2 | (47) 100 | (44) 100 | | (56) 98.2 | | (53) 100 | (67) 100 | |
| 7/31 | | (21) 90.4 | | | (32) 96.8 | (24) 91.6 | (27) 96.2 | | | (23) 100 |
| 9/1 | (32) 43.5 | (48) 43.5 | | | (34) 67.6 | (31) 90.3 | (42) 59.5 | | | |
| <u>Ribes lacustre</u> | | | | | | | | | | |
| 6/17 | | (5) 60.0 | (7) 100 | (5) 100 | | (3) 100 | | (4) 100 | (4) 100 | |
| 7/30 | (6) 66.7 | (4) 75.0 | | | (5) 100 | (4) 100 | (3) 100 | | | |
| 8/31 | (4) 0 | (5) 0 | | | (4) 0 | (4) 25.0 | (4) 0 | | | |

The results in combining 2,4,5-T and 2,4-D as a mixed spray are shown in table 2. This series of plots was established to compare similar concentrations of 2,4,5-T with and without the addition of 2,4-D. Size of plot and dosage rate were the same in both instances. The computations show that for a total acid content of 3,000 p.p.m. or less, 2,4,5-T is less effective in combination with 2,4-D than when used alone. The mixed spray takes the characteristic of 2,4-D in being significantly less effective than 2,4,5-T alone on R. lacustre and R. viscosissimum after new growth has fully developed.

By comparison with knapsack spraying, the results in applying 2,4,5-T concentrates with the Hi-Fog gun are shown in table 3. Interest in these tests was between differences in concentration of 2,4,5-T, diluents, and season or growth stage of ribes when treated. These are the conclusions: (1) water plus 5 percent oil emulsion is as good a diluent as Diesel oil during the regular spray season, (2) Diesel oil should be used in late fall when night temperatures begin to drop below freezing when the acid tends to precipitate from solution, and (3) with low volume treatment the concentration of 2,4,5-T should never drop below 20,000 p.p.m. For late season work after August 15, the concentration of 2,4,5-T should be raised to 40,000 p.p.m. Failure in killing all bushes with the water plus oil emulsion formulation of 2,4,5-T at 20,000 p.p.m. or higher lies in the fact that root crowns were not adequately drenched. This is difficult to accomplish where R. viscosissimum grows in large numbers, and where the root centers of the trailing type R. lacustre cannot easily be found. Results will be better in both instances if the knapsack or power sprayers for large volume dosages are used instead of the Hi-Fog gun.

TABLE 3

RESULTS OF APPLYING 2,4,5-T CONCENTRATE SPRAY WITH THE HI-FOG GUN

| Plot Nos. | Date Sprayed | Ribes Species | Diluent | Parts Per Million | | | |
|-----------|--------------|-------------------------|----------------------------|------------------------|-----------------------------|-----------|-----------|
| | | | | 43,000 (No. Bushes) | 21,500 Percent Bush Kill | 14,333 | 10,750 |
| 25-27 | 6/18 | <u>R. lacustre</u> | Fuel Oil | | (20) 95.0 | (20) 90.0 | (20) 95.0 |
| 28-30 | 6/18 | | Fuel Oil & TBP | | | | |
| 31 | 6/18 | | Water | | (20) 100 | | |
| 65 & 67 | 7/21 | | H ₂ O & 10% Oil | (23) 95.6 | (21) 95.2 | | |
| 66 | 7/21 | | H ₂ O & 5% Oil | | (25) 92.0 | | |
| 68-69 | 7/21 | | Fuel Oil | (20) 100 | (21) 95.2 | | |
| 70-71 | 7/22 | | Fuel Oil & TBP | (22) 90.8 | (20) 95.0 | | |
| 72-73 | 7/22 | | Water | (20) 100 | (20) 100 | | |
| 91-92 | 7/30 | | Fuel Oil & TBP | (20) 55.0 | (20) 60.0 | | |
| 93-94 | 7/30 | | Fuel Oil | (20) 100 | (20) 95.0 | | |
| 95-96 | 7/30 | | H ₂ O & 5% Oil | (20) 90.0 | (20) 90.0 | | |
| 131-132 | 8/17 | | Fuel Oil | (7) 100 | (9) 88.9 | | |
| 133-134 | 8/17 | | Fuel Oil & TBP | (15) 73.2 | (10) 90.0 | | |
| 135-136 | 8/17 | | Water | (6) 100 | (10) 80.0 | | |
| 137-138 | 8/17 | | H ₂ O & 5% Oil | (9) 100 | (12) 100 | | |
| 154-155 | 9/2 | | Fuel Oil | (20) 100 | (20) 85.0 | | |
| 156-157 | 9/2 | | Fuel Oil & TBP | (20) 60.0 | (20) 65.0 | | |
| 158-159 | 9/2 | | H ₂ O & 5% Oil | (20) 90.0 | (20) 85.0 | | |
| 48-50 | 6/30 | <u>R. viscosissimum</u> | Fuel Oil | | (40) 100 | (40) 100 | (40) 100 |
| 51-53 | 6/30 | | Fuel Oil & TBP | | (40) 95.0 | (40) 100 | (40) 97.5 |
| 54-56 | 6/30 | | Water | | (40) 100 | (40) 100 | (40) 92.5 |
| 65 & 67 | 7/21 | | H ₂ O & 10% Oil | (25) 100 | (15) 100 | | |
| 66 | 7/21 | | H ₂ O & 5% Oil | | (20) 100 | | |
| 68-69 | 7/21 | | Fuel Oil | (20) 100 | (20) 100 | | |
| 70-71 | 7/22 | | Fuel Oil & TBP | (20) 100 | (20) 100 | | |
| 72-73 | 7/22 | | Water | (20) 100 | (20) 100 | | |
| 110-111 | 7/31 | | H ₂ O & 5% Oil | (40) 100 | (40) 97.5 | | |
| 112-113 | 7/31 | | Fuel Oil | (40) 97.5 | (40) 97.5 | | |

(continued on following page)

TABLE 3 (continued)

| | | Parts Per Million | | | | | |
|-----------|--------------|-------------------|---------------------------|--------------|-----------|-------------------|--------|
| Plot Nos. | Date Sprayed | Ribes Species | Diluent | 43,000 | 21,500 | 14,333 | 10,750 |
| | | | | (No. Bushes) | | Percent Bush Kill | |
| 114-115 | 7/31 | R. viscosissimum | Fuel Oil & TBP | (40) 92.5 | (40) 90.0 | | |
| 131-132 | 8/17 | | Fuel Oil | (25) 100 | (20) 100 | | |
| 133-134 | 8/17 | | Fuel Oil & TBP | (20) 80.0 | (21) 80.0 | | |
| 135-136 | 8/17 | | Water | (15) 93.2 | (15) 86.7 | | |
| 137-138 | 8/17 | | H ₂ O & 5% Oil | (20) 100 | (20) 100 | | |
| 173-174 | 9/1 | | Fuel Oil | (40) 100 | (40) 100 | | |
| 175-176 | 9/1 | | Fuel Oil & TBP | (40) 100 | (40) 95.0 | | |
| 177-178 | 9/2 | | H ₂ O & 5% Oil | (40) 100 | (40) 100 | | |

When the plots were first examined in May, many bushes were commencing to resprout or contained green cambium in the basal stems and root crowns. After noting how discolored and feeble the resprouts appeared and that most adventitious buds were dead on those bushes with green cambium in basal stems and root crowns, it was decided to re-examine the plots at three intervals during the growing season. A check of live and dead bushes in June, July, and October showed these interesting facts: (1) bushes in significant numbers continue to die until about July 1 regardless of the date when sprayed the previous season, (2) no resprouting was observed after July 1, (3) if all adventitious buds are dead and live stem killed within 6 inches of the root crown, no resprouting occurred, though the crown may stay green throughout the season, and (4) it was obvious that respraying should be delayed until mid-July or later so all resprouting bushes can be easily found and treated. A more desirable time to respray would be in May and June of the second season following initial spraying.

Such materials as tributyl phosphate and Geon 31-X latex added to 2,4,5-T spray to increase penetration or lower the rate of transpiration made a less effective formulation on ribes than a straight aqueous spray of 2,4,5-T. The tributyl phosphate tests are shown in table 3. There were three plots of the Geon 31-X latex series of 750 p.p.m. of 2,4,5-T to which was added 10 percent, 5 percent, and 1 percent latex compound. In plot 116 (10 percent latex), 9 R. viscosissimum and 5 R. lacustre were sprayed; the percent bush kill was 77.8 and 60, respectively. Plot 117 (5 percent latex) contained 8 R. viscosissimum and 7 R. lacustre; the percent bush kill was 87.5 and 42.7. In plot 118 (1 percent latex), 11 R. viscosissimum were sprayed, killing 91.1 percent, and 5 R. lacustre, killing 2 bushes or 40 percent.

HERBICIDES TESTED IN 1949

One newly introduced herbicide was tested on ribes this season: Weedone Brush Killer 32, a commercial mixture combining one and one-third lbs. of 2,4-D acid and two-thirds lb. of 2,4,5-T acid per gallon formulated as the butoxy ethanol esters plus emulsifying and penetrating agents. The object was to compare the effectiveness of this mixture with 2,4,5-T alone and a field mixture of 2,4-D and 2,4,5-T.

Knapsack and Hi-Fog gun tests. The first tests with brush killer 32 were established in the Clearwater Forest July 20. Four plots were sprayed with concentrations of 250, 500, 750, and 1,000 p.p.m. of 2,4,5-T. The concentration of 2,4-D would be approximately twice that of 2,4,5-T contained in brush killer 32. One gallon of spray was applied to each milacre plot. On July 28, 10 plots were established on Potter Creek in the Coeur d'Alene National Forest. Four plots were sprayed with 250, 500, 750, and 1,000 p.p.m. of 2,4,5-T in brush killer 32, and a fifth plot with 500 p.p.m. applied to leaves and stems only. The plots in the concentration series were treated by applying spray to the root crowns, stems, leaves, and growing stem tips of ribes. To compare the effectiveness of brush killer 32 with straight 2,4,5-T and mixed with 2,4-D, tests included three 2,4,5-T concentration plots and two of mixed solution. One of the latter contained 500 p.p.m. of 2,4,5-T and 1,000 p.p.m. of 2,4-D, and the other, 1,000 p.p.m. of 2,4,5-T and 2,000 p.p.m. of 2,4-D. The straight 2,4,5-T concentration tests included a 500 and a 1,000 p.p.m. conventionally applied, and one 500 p.p.m. plot in which spray was applied only to the aerial portion of ribes

bushes. The Potter Creek tests were made on R. viscosissimum. The identical tests were replicated on R. lacustre in Iron Creek July 29. In addition, four concentrate tests were made using 5,000 and 10,000 p.p.m. of 2,4,5-T straight in comparison to that contained in the commercial mixture brush killer 32. On August 3 and 4, the entire series of tests were replicated on LaClerc Creek in the Kaniksu National Forest. These plots contained both ribes species growing on a severe site. The last tests with brush killer 32 for the season in the Coeur d'Alene National Forest were established September 23 on Potter Creek (plot numbers 39 to 42). The concentrations of 5,000 and 10,000 p.p.m. of straight 2,4,5-T were compared with equal amounts contained in brush killer 32. Spray was applied with the Hi-Fog gun. In examining the Coeur d'Alene and Kaniksu plots in October, the only injury observed was the gradual dying-back of live stem typical of the way in which 2,4,5-T commences to kill a bush during the season of treatment.

Buffalo turbine tests. Seven roadside tests of the turbine blower in applying an aqueous solution of 2,4,5-T in the Clearwater Forest were made in cooperation with F. O. Walters, M. C. Riley, and H. J. Faulkner. Two of the seven tests were double runs (the same ground sprayed from opposite directions). The other five plots were sprayed from a single direction. The concentration of 2,4,5-T varied from 1 to 5 percent with 5 percent oil emulsion added as a spreader material for the water formulation. The distance to which the mist spray can be blown depends upon slope, and direction and velocity of wind. On the average, it appears that about $\frac{1}{2}$ chain can be effectively sprayed along the road with the fishtail nozzle. The oval nozzle reaches out from where the fishtail leaves off to about 1 chain distance from the blower. There is every indication from the way ribes are reacting that a satisfactory kill will be obtained. If so, the turbine blower affords a rather inexpensive method of spraying large populations of ribes along roadsides.

Applying 2,4,5-T by helicopter. The initial test in the western white pine region in spraying ribes and brush with 2,4,5-T by helicopter was made from June 21-27 in the Coeur d'Alene National Forest. The study was jointly undertaken by the Forest Service and the Bureau of Entomology and Plant Quarantine. Twelve 2-acre plots were established and treated to study dosage, concentration of 2,4,5-T, and the comparative effectiveness of oil and water diluents. Six of the plots were sprayed with a water-oil emulsion formulation and the other six with the diluent Diesel oil. Two dosage rates were used for each of the diluents, three plots getting 5 gallons of spray per acre and the other three getting 10 gallons. The proprietary material 2,4,5-T was applied at the rates of 1, 2, and 3 lbs. of acid per acre for the 5- and 10-gallon treatments. Final results will be reported in 1950. In the meantime, a special report has been prepared giving in detail methods and techniques employed in spraying by helicopter over mountainous terrain. A table is also included giving an estimate of probable damage to ribes, brush, and conifers. These data were taken 12 weeks after spraying. This special report can be obtained from the U. S. Forest Service, Missoula, Montana, or the Office of Blister Rust Control, Spokane, Washington.

STOCKING-RUST DAMAGE SURVEY, 1949

By

R. T. Bingham, Pathologist

Training school

A 4-day school for training surveymen in the determination of forest stocking as affected by blister rust damage was held at Clarkia, Idaho, Blister Rust Headquarters, June 20 to 23, inclusive. A total of 36 men attended. Included in this number were surveymen, survey party leaders, and supervisory personnel from the blister rust control operations.

Training progressed daily as follows:

First day - Methods of examining white pines for blister rust cankers including blister rust life history, recognition of rust stages on ribes and white pine, dating of blister rust cankers, determination of killing cankers, examination of reproduction and pole size white pine for blister rust and killing cankers, tree climbing, and tree-climbing safety.

Second day - Silvicultural characteristics of western white pine including tolerance, dominance, and ability to express dominance under competition of Inland Empire coniferous tree species. Survey equipment and methods, including special equipment used in survey work, the stocked-quadrat and crop tree concepts, recognition of crop trees, occupancy of stocking quadrats by crop trees, determination of site index, demonstration of survey line examination, and trial runs of short, staked and strung survey lines by individual surveymen.

Third day - Practical application of survey methods and use of survey data forms including examination of 20 to 40 chains of survey lines by survey crews, recording survey line data, summarization of data taken from all lines on the surveyed area, mapping data taken on the surveyed area, and interpretation of the mapped data.

Fourth day - Training in recognition of the symptoms of pole blight of western white pine, conducted by Dr. T. S. Buchanan and Mr. George M. Harvey of the University of Idaho School of Forestry, Department of Forest Pathology.

A "Northwestern Region Stocking-Rust Damage Survey Manual, 1949," prepared in the spring of 1949, was issued to all personnel attending the school.

Report of survey coverage for 1949

Nine parties composed of 41 leaders and surveymen made stocking and rust damage surveys in the 6 blister rust control operations of this region. Approximately 900 miles of survey line were run by the various Forest Service and Bureau of Entomology and Plant Quarantine parties.

Additional survey lines were run in many working units given only preliminary surveys in 1948 to secure more complete information. Many unsurveyed units were also investigated. It is anticipated that the large amount of survey work completed in 1948 and 1949 will make possible a material reduction in the size

and cost of future survey jobs. The work of the last 2 years, approximating 2,000 miles of survey line, has provided most of the white pine stocking and rust damage information needed for completion of unit area analyses.

Methods investigations related to survey work

Mr. C. A. Wellner of the Forest Experiment Station and Mr. D. J. Moore of the Division of Timber Management, U. S. Forest Service, Region 1, cooperated with the office of Blister Rust Control in an investigation of mortality rates among white pine crop trees 60 years or more of age. This work was done to determine whether mortality among such trees as predicted by present survey calculations was substantially correct. Results showed annual percent mortality on the Experiment Station's plots to be close enough to that predicted by survey calculations ($\frac{2}{3}$ of 1 percent per year) so that change in calculating methods was not warranted. These men also prepared a revised yield table to predict timber yields in the western white pine type, for use in unit area analysis.

Periodic field checks were made upon the accuracy of survey results. Of particular interest was the accuracy of the percentage of white pine stocking and the accuracy of the percentage of the white pine stocking lost to blister rust for any given area. In general, the percentages of white pine stocking and rust loss were accurate within plus or minus 15 percent of the percentages themselves in two out of three cases. Investigations to determine whether results of equal reliability could be obtained by widening the interval between survey lines hold some promise for reducing the cost of survey work. On areas several sections or more in size, survey lines at 40 chain intervals gave equally reliable percentages of loss in white pine stocking due to rust. On the same large areas, survey lines at 20 chain intervals gave equally reliable percentages of white pine stocking.

PHOTOGRAPHIC AND EDUCATIONAL WORK, 1949

By

Frank O. Walters, Assistant Regional Leader

H. Miller Cowling, Photographic Specialist

Photographic

The most important field photography this year was recording the initial helicopter spraying work in this region. Every phase of the project was recorded by moving and still pictures. Picture points were established to make a continuous record of the results. This will be an addition to the several other series pictures, which have been carried over a period of years and have proven valuable records.

Cooperation was given agencies carrying on pole blight studies. Pictures were taken of the various phases of the disease in the Coeur d'Alene and Kaniksu National Forests. Pictures were processed for the research laboratories.

Three days were spent in Glacier National Park taking motion and still pictures of all phases of the work. The purpose was to secure pictures for use in the educational and training programs. Duplicate films have been made of the motion pictures to be used for demonstration purposes and for inclusion in the Northwestern Region's film, "A Destructive Invader," when a revision is made.

All maps, tables, and photographs appearing in this report have been processed for printing by the photographic section.

Educational

Two large groups were shown phases of blister rust control in the field. The Timber Products Bureau of the Spokane Chamber of Commerce visited the Forest Service Nursery at Haugan, Montana, and adjacent logging and milling operations. The group saw how white pine seedlings are raised in the nursery and inspected the severe blister rust damage in the unprotected white pine stands in Deer Creek. One luncheon meeting of the Moscow, Idaho, Chamber of Commerce was devoted to blister rust. The film, "A Destructive Invader," was shown. High lights of the problem in Idaho were outlined by the Regional Leader. Later in the week, members of the Chamber were conducted on a tour covering parts of the St. Joe operation where they saw extensive potential white pine resources in plantations and natural pole and reproduction areas. Large scale logging operations brought out the economic importance of the white pine industry.

The new western blister rust film, "A Destructive Invader," has been in almost constant use since it was received. It has had 34 showings with 2,255 people in attendance.

The movie film, "Blister Rust Enemy of the Pines," has been loaned to the film library of the Spokane public schools. It is being used both in the grades and high schools for courses in biology and Washington State history.

A blister rust exhibit at the Sportsmen's Fair in Spokane occupied a prominent place and was viewed by 50,000 people. Use was made of live pine and ribes to indicate the life cycle of the disease. Pictures which had been colored helped to make the booth attractive. An important part of the exhibit was a diorama prepared by the Forest Service. A similar exhibit was on display in Priest River, Idaho, during the log drive celebration. An estimated 6,000 people saw this display.

PHOTOGRAPHIC, MULTILITH, BLACKLINE, AND MIMEOGRAPH WORK

| Item | North-western Region | Pacific Coast Region | Total |
|-------------------------------|----------------------|----------------------|---------|
| PHOTOGRAPHIC | | | |
| Lantern slides, natural color | 192 | | 192 |
| Films developed, field films | 109 | | 109 |
| roll film | 2 | | 2 |
| packs | 2 | | 2 |
| Copies, 5x7 | 31 | | 31 |
| 8x10 | 129 | 25 | 154 |
| Printing, 4x5 or smaller | 142 | 220 | 362 |
| 5x7 | 1,139 | | 1,139 |
| 8x10 | 252 | | 252 |
| 9x11 | 772 | 95 | 867 |
| Enlarging on film | | 18 | 18 |
| paper, 5x7 | | 50 | 50 |
| 9x12 | 34 | | 34 |
| 16x20 | 6 | 317 | 323 |
| Total Items | 2,810 | 725 | 3,535 |
| MULTILITH | | | |
| Duplimats | 156 | | 156 |
| Plates | 183 | 22 | 205 |
| Cards | 2,000 | 1,500 | 3,500 |
| Sheets | 72,800 | 4,000 | 76,800 |
| Total Prints | 74,800 | 5,500 | 80,300 |
| BLACKLINE PRINTER | | | |
| Total Prints | 1,665 | 64 | 1,729 |
| MIMEOGRAPH | | | |
| Stencils | 50 | | 50 |
| Sheets | 14,550 | | 14,550 |
| GRAND TOTAL All Items | 94,214 | 6,311 | 100,525 |



W-576

Exhibit at the 1949 Spokane Sportsmen's Fair. Diorama at the right prepared by the U. S. Forest Service.

ORGANIZATION OF THE NORTHWESTERN REGIONAL OFFICE - 1949

1. Regional Leader in Charge, H. E. Swanson, Pathologist
2. Assistant Regional Leader, F. O. Walters, Pathologist
3. Cooperative Local Control:
 - a. Clearwater Operation, Idaho:
Operation Supervisor, M. C. Riley, Forester
Assistant Operation Supervisor, H. J. Faulkner, Forester
Camp Superintendent, William Holland, Agent (Fur. eff. 12/1/49)
 - b. St. Joe Operation, Idaho:
Operation Supervisor, H. J. Hartman, Forester
Assistant Operation Supervisor, W. F. Painter, Pathologist
Unit Supervisor, Donald F. Williams, Agent
Special Duty Assistant, R. E. Myers, Agent
Camp Superintendent, A. E. Turner, Agent (Fur. eff. 10/30/49)
 - c. Coeur d'Alene Operation, Idaho:
Operation Supervisor, F. J. Heinrich, Pathologist
 - d. Kaniksu Operation, Idaho-Washington:
Operation Supervisor, H. A. Brischle, Pathologist
Asst. Operation Super., S. S. Evans, Agent (Trans. to F.S. 2/21/49)
Unit Supervisor, L. J. Easley, Agent (Fur. eff. 11/17/49)
 - e. Montana Operation:
Operation Supervisor, A. S. Skoglund, Pathologist
 - f. National Parks, Washington-Montana-Wyoming:
Operation Supervisor, J. C. Gynn, Pathologist
Assistant Operation Supervisor, C. M. Chapman, Pathologist
4. Projects:
 - a. Education and Information:
H. M. Cowling, Photographic Specialist
J. C. Gonyou, Draftsman
 - b. Disease Survey and Scouting
R. T. Bingham, Pathologist
 - c. Methods Development and Control Investigation (BLR 1-6):
V. D. Moss, Forest Ecologist
J. F. Breakey, Pathologist
C. R. Stillinger, Pathologist (Retired 6/30/49)
(Personnel assigned to Northwestern Region by H. R. Offord)
5. Business Administration and Clerical:
 - a. S. J. Dorick, Administrative Assistant
E. K. LaPrey, Storekeeper
L. C. Miller, Automobile Mechanic
 - b. M. L. McWold, Administrative Assistant, Fiscal
M. C. Yourt, Clerk
 - c. M. P. Kirsten, Clerk
A. B. Treffry, Secretary (Steno.)
M. I. Williams, Clerk-Stenographer (Resigned 2/18/49)
J. L. Radkey, Clerk-Typist
 - d. L. E. Klatt, Administrative Assistant, Personnel
E. E. Smith, Clerk-Stenographer

APPROPRIATIONS
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
NORTHWESTERN REGION OF BLISTER RUST CONTROL

Regular Appropriations

Fiscal Year 1949:

| | | |
|-----------------------------------|-------------------|--------------|
| Project 71.14 NW (Administrative) | \$134,069.00 | |
| Project 73.14 NW (Cooperative) | <u>111,000.00</u> | |
| | | \$245,069.00 |

Fiscal Year 1950 (as of 12/31/49):

| | | |
|------------------------------------|-------------------|--------------|
| Project W-a.14 NW (Administrative) | \$138,000.00 | |
| Project W-e.14 NW (Cooperative) | <u>107,350.00</u> | |
| | | \$245,350.00 |

Contributed Funds (deposited with U. S. Treasury)

| | | | |
|---|-----------------|------------------|--------------|
| State of Idaho | | \$ 20,000.00 | |
| Clearwater Timber Protective Association | \$6,531.28 | | |
| Potlatch Timber Protective Association | 5,430.30 | | |
| Priest Lake Timber Protective Association | <u>4,055.00</u> | <u>16,016.58</u> | |
| | | | \$ 36,016.58 |

TABLE 1

FEDERAL EXPENDITURES, NORTHWESTERN REGION OF BLISTER RUST CONTROL
CALENDAR YEAR 1949, REGULAR APPROPRIATIONS

| | Project | Salaries | Expense | Total |
|-----------------------------|--|--------------|-------------|--------------|
| January 1 to June 30, 1949 | | | | |
| I | Planning, Coordination, Technical Direction | | | |
| | 1.1 - Clearwater Operation, Idaho | \$ 6,516.33 | \$ 1,509.17 | \$ 8,025.50 |
| | 1.2 - St. Joe Operation, Idaho | 8,313.78 | 5,140.34 | 13,454.12 |
| | 1.3 - Coeur d'Alene Operation, Idaho | 2,918.81 | 454.09 | 3,372.90 |
| | 1.4 - Kaniksu Operation, Idaho | 5,649.15 | 1,257.06 | 6,906.21 |
| | 1.6C - Cabinet Operation, Montana | 1,527.66 | 299.23 | 1,826.89 |
| | 1.6K - Kootenai Operation, Montana | 1,527.67 | 299.22 | 1,826.89 |
| | 1.7 - National Parks | 5,186.53 | 876.50 | 6,063.03 |
| | 1.A - Office Maintenance | 16,527.61 | 5,129.71 | 21,656.32 |
| | 1.B - Supervision | 6,791.11 | 266.54 | 7,057.65 |
| | 1.C - Education and Information | 2,308.68 | 283.65 | 2,592.33 |
| | 1.D - Control Investigations | - | 13.91 | 13.91 |
| | 1.E - Methods Development | - | 247.91 | 247.91 |
| | Total, Project I, Jan. 1-June 30, 1949 | \$ 57,267.33 | \$15,776.33 | \$ 73,043.66 |
| III | Cooperative Ribes Eradication on State and Private Lands | | | |
| | 3.1 - Clearwater Operation, Idaho | \$ 10,974.84 | \$ 3,496.66 | \$ 14,471.50 |
| | 3.2 - St. Joe Operation, Idaho | 7,411.56 | 1,635.54 | 9,047.10 |
| | 3.4 - Kaniksu Operation, Idaho | 1,682.75 | 1,028.29 | 2,711.04 |
| | Total, Project III, Jan. 1-June 30, 1949 | \$ 20,069.15 | \$ 6,160.49 | \$ 26,229.64 |
| July 1 to December 31, 1949 | | | | |
| I | 1.1 - Clearwater Operation, Idaho | \$ 5,009.85* | \$ 1,130.82 | \$ 6,140.67 |
| | 1.2 - St. Joe Operation, Idaho | 7,718.75* | 1,509.84 | 9,228.59 |
| | 1.3 - Coeur d'Alene Operation, Idaho | 1,759.48* | 404.85 | 2,164.33 |
| | 1.4 - Kaniksu Operation, Idaho | 3,920.07* | 842.28 | 4,762.35 |
| | 1.6C - Cabinet Operation, Montana | 871.05* | 255.10 | 1,126.15 |
| | 1.6K - Kootenai Operation, Montana | 871.05* | 255.11 | 1,126.16 |
| | 1.7 - National Parks | 4,970.28 | 1,217.67 | 6,187.95 |
| | 1.A - Office Maintenance | 15,375.92 | 4,575.37 | 19,951.29 |
| | 1.B - Supervision | 6,420.05 | 524.04 | 6,944.09 |
| | 1.C - Education and Information | 2,204.78 | 286.99 | 2,491.77 |
| | 1.D - Control Investigations | 1,052.26* | 451.43 | 1,483.69 |
| | 1.E - Methods Development | - | 75.94 | 75.94 |
| | Total, Project I, July 1-Dec. 31, 1949 | \$ 50,173.54 | \$11,509.44 | \$ 61,682.98 |
| III | 3.1 - Clearwater Operation, Idaho | \$ 22,801.06 | \$ 5,749.84 | \$ 28,550.90 |
| | 3.2 - St. Joe Operation, Idaho | 30,332.31 | 5,093.81 | 35,426.12 |
| | 3.4 - Kaniksu Operation, Idaho | 2,535.36 | 6,710.90 | 9,246.26 |
| | Total, Project III, July 1-Dec. 31, 1949 | \$ 55,668.73 | \$17,554.55 | \$ 73,223.28 |
| | Grand Total, Calendar Year | \$183,176.75 | \$51,000.81 | \$234,179.56 |

*Salaries of operation supervisors repaid to our appropriation by the Forest Service not included in these totals, nor are any other items included for which repayment has been made by the Forest Service, National Park Service, or Fruit Fly Investigations.

TABLE 2

SUMMARY OF EXPENDITURES FROM STATE AND
PRIVATE FUNDS, 1928 - 1949, IDAHO

| Year | State | T.F.A. | Total |
|-------|--------------|--------------|--------------|
| 1928 | \$ 2,518.55 | \$ 2,264.32 | \$ 4,782.87 |
| 1929 | | 19,027.66 | 19,027.66 |
| 1930 | | 20,000.00 | 20,000.00 |
| 1931 | 5,000.00 | 35,905.32 | 40,905.32 |
| 1932 | 8,003.43 | 11,186.33 | 19,189.76 |
| 1933 | | | |
| 1934 | 29,154.06 | | 29,154.06 |
| 1935 | 15,000.00 | | 15,000.00 |
| 1936 | 16,998.25 | | 16,998.25 |
| 1937 | 15,001.25 | | 15,001.25 |
| 1938 | 15,000.44 | | 15,000.44 |
| 1939 | 15,438.04 | | 15,438.04 |
| 1940 | 10,034.48 | | 10,034.48 |
| 1941 | 7,542.73 | 15,756.40 | 23,299.13 |
| 1942 | 22,761.68 | 15,440.78 | 38,202.46 |
| 1943 | 12,252.13 | 386.68 | 12,638.81 |
| 1944 | 12,506.60 | 15,612.98 | 28,119.58 |
| 1945 | 6,297.68 | 5,111.03 | 11,398.71 |
| 1946 | 14,943.35 | 26,281.65 | 41,595.00 |
| 1947 | 15,028.11 | 15,809.24 | 30,837.35 |
| 1948 | 20,025.00 | 15,953.94 | 35,978.94 |
| 1949 | 20,003.03 | 16,016.58 | 36,019.61 |
| Total | \$263,496.91 | \$216,222.91 | \$479,721.72 |